CHAPTER 4.0

LOWER WEST FORK DEIS RESPONSE TO COMMENTS

4.1 INTRODUCTION

The Forest Service solicited comments on the Lower West Fork Project Draft Environmental Impact Statement (DEIS) from April 10, 2009 through May 26, 2009. The ID Team and Deciding Officer read all of the letters received from organizations, government entities, and individuals and identified the comments. The responses to the comments follow below. The comments are highlighted in gray, bolded and numbered. Following the comment is the Forest Service response. Copies of the entire comment letters are included in this chapter following the comments and responses section.

The following table shows the names and comment codes assigned to the letters for everyone who submitted comments on the DEIS.

Name	Comment Code
Log Cabin Environmental Consulting, LLC	LCEC
Bitterroot Adventures	BA
Lost Trail Powder Mountain - Bill Grasser	LTPM
Craig E. Thomas	CT
Smurfit-Stone Container	SSC
Friends of the Bitterroot & WildWest Institute	FOB/WWI
United States Environmental Protection Agency	USEPA
United States Department of the Interior	No comments

4.2 COMMENTS AND RESPONSES

LCEC-1. I would like to compliment the Forest Service for trying to improve forest health, fisheries and soil stability on 5,100 acres in the lower West Fork. The majority of this project appears to be well-planned for the benefit of the forest and wildlife and will have little impact on the public with the exception of the use of fire.

Thank you

LCEC-2: I am concerned that the Forest Service continues to use prescribed fire, underburns of slash and slash pile burns. I would like for you to adopt a "no prescribed burns or slash burns or open burning policy' in Ravalli County.

I believe that our government should set a good example for the public by implementing practices that aggressively protect our environment and public health.

…why should a government agency, or anyone for that matter, continue to voluntarily burn and cause air pollution

The Lower West Fork Project FEIS is a site-specific analysis of the effects of applying the Forest Service fire use policies. It does not address making policy.

The Interdisciplinary team (ID Team) considered an alternative that would reduce fuel through timber harvest but not use fire to treat the resulting slash (FEIS pg. 2-17). Slash could be ground into chips, which would require whole tree yarding. The nearest market is 100 miles from the analysis area and is a limited

option at this time. In addition, chip vans have a wider turning radius than typical log trucks and may not be able to access some units. Under Alternatives 2 and 3, chipping is an option if the market is available and the units are accessible (FEIS pg. 2-8, 2-14).

This alternative would not treat the prescribed fire only units, which would maintain pathways by which fire could threaten resources in and adjacent to the WUI. It would not reduce fuel loads adequately and may increase fuel loads in some situations. Therefore, it would not meet the purpose of reducing fuel loads and lowering crown fire hazard. Not treating the prescribed fire units would decrease the fuels management effectiveness at the landscape-level (Arno and Fiedler 2005, Finney et al. 2005).

Arno et al. state (1995) "Cutting without subsequent burning is ineffective for forest restoration because only fire can efficiently remove large proportions of the small understory trees that occupy managed stands and which if not removed, will develop into thickets of stressed trees. In addition, fire produces unique changes in soil chemistry such as increased pH and rapid oxidation of nutrients, both of which may significantly influence nutrient availability."

The benefit of using prescribed fire is that they are ignited only when favorable smoke dispersal conditions are forecast. The Forest Service employs Best Available Control Technology (FEIS pg. 3.4-5) to limit the production and persistence of smoke in populated areas. These practices reduce the potential for the concerns raised in this issue. Results from the Smoke Impact Spreadsheet and CALPUFF modeling (FEIS pgs. 3.4-8 thru 12) indicate the level of particle pollution would be below 35ug/m^3, the National Ambient Air Quality Standard for Particle Pollution (Table 3.4-2, FEIS pg. 3.4-9). Additionally, modeling results indicate that most of the fine particles (particulate matter less than 2.5 micrometers in diameter (PM2.5)) will be concentrated within 0.1 mile of the prescribed fire units (Figs. 3.4-5 and 3.4-6, FEIS pgs. 3.4-10.and 3.4-11), which are located away from population centers.

LCEC-3: I am concerned about air pollution from any source. And, I am very concerned that government agencies continue to use open burning when Ravalli County has been knocking on the door of air quality nonattainment status for several years.

Ravalli County is near non-attainment status (has exceeded or is close to exceeding NAAQS for fine particulates for many of the last 5 years) and subject to inversions in a narrow mountain valley,…

When we discussed the air monitoring data and results that exceeded air quality standards for 2004 and 2005, many Ravalli County residents pointed at the Forest Service as the pollution source.

The DEIS does not even mention that Ravalli County is near non-attainment status for air quality. I believe the DEIS needs to more seriously address the alternatives to burning with our health in mind.

Ravalli County is not currently in non-attainment status. Montana Airshed 4 includes all of Ravalli County (FEIS pg. 3.4-1). The Montana Department of Environmental Quality has designated Montana Airshed 4 as an attainment area (FEIS 3.4-6). The FEIS does not specifically mention Ravalli County as a non-attainment area but does state, "The Lower West Fork project area lies entirely within Montana Airshed 4. National Air Quality Standards for fine particulates are shown in Table 3.4-1 (FEIS pg. 3.4-4). The State of Montana requires all users of prescribed fire to apply Best Available Control Technology as described on page 3.4-5 of the FEIS. The effects analysis shows the proposed prescribed burning treatments will produce low amounts of PM2.5 and have minimal visibility and health effects beyond 0.1 miles from the treatment locations (FEIS pg. 3.4-8). Based on this analysis the proposed treatments would not cause Airshed 4 to reach non-attainment status.

Air Quality Index Charts from 2000 to the present (http//www.epa.gov) indicate air quality standards were exceeded in 2000, 2003, 2005 2006, and 2007 during August. Fine particulates at this time of year would be from wildfires. There were no instances of exceeding or approaching air quality standards between March and July, the months in which prescribed fires are typically ignited. Air quality standards were exceeded infrequently between December and February, which would be associated with weather

inversions and burning wood for heat (FEIS pg. 3.4-5 thru 3.4-7). Due to the poor smoke dispersion during the winter, Airshed 4 is closed to open burning during the months of December, January and February.

LCEC-4: …recently the air monitoring results showed unhealthy health effects for hourly air monitoring in March.

March 12 was the only day in 2009 when average hourly particulate levels peaked at 109 µg/m3 at 10:00 pm (2200 hours). A review of the Montana/Idaho Airshed Group Smoke Monitoring Unit's database and the Hamilton dispatch radio logs shows that there were no prescribed burns conducted by the Forest Service on that date (personal comm. Lubke 2009).

LCEC-5: I believe you can accomplish your fuel reduction goals without prescribed burning and slash burning.

Prescribed burning is one method the Forest Service uses to reduce fuels. We endeavor to sell the excess fuel as sawlogs, chips, or other small wood products (FEIS 2-5, 2-8 –2.13). We also retain coarse wood and some fine woody material (as long as it does not create high fuel loading) on site for soil productivity purposes (FEIS pg. 3.5-13). However, these other methods of reducing excess fuels do not always meet the objectives and the Forest Service must use prescribed fire.

Stephens et al. (2009) shows the importance of using prescribed fire after mechanical treatments in order to increase the treatment effectiveness of reducing potential fire severity under severe weather conditions. "Across all fire and fire surrogate sites using mechanical treatments, the relative potential for active crown fire (as measured by the crowning index) was lowest in mechanical plus fire treatments, followed by the mechanical-only treatments, closely followed by fire-only treatments (fall or spring), and highest in the controls (Fig. 3)." (Stephens et al. 2009: pg. 310). Their results also show that areas only treated by mechanical means had higher tree mortality under severe weather conditions than those that used a combination of mechanical and prescribed fire.

LCEC-6: …why the environmental impact analysis did not provide statistics on how many wildfires were caused by slash piles or prescribed burns or open burning. Are you really reducing the wildfire potential by burning? Would thinning, harvesting, composting, chipping or other methods work just as well or better than burning?

The Forest Service uses all the methods listed above in LCEC-5 to reduce fuels but they are not always adequate to meet the fuel reduction needs. Often there are no markets for fuels created by timber harvest or thinning, leaving prescribed fire as the most cost effective methods of removal. Stephens et al. (2009) shows the importance of using prescribed fire after mechanical treatments in order to increase the treatment effectiveness and reduce potential fire severity under severe weather conditions (See LCEC-5 above).

All prescribed fire has the potential for escape; however, the preparation described in the proposed action would sufficiently reduce the potential by removing ladder fuels and increasing crown spacing. The Bitterroot National Forest (Bitterroot NF) has used prescribed fire on an average of 3,200 acres per year since 1991. In the past 17 years only two prescribed fires have escaped control lines and were declared wildfires, the Overwhich Fire in 1991, and the Beaver Woods Fire in 2004. Both of these fires were being conducted in activity fuels and were in the final stages of mop-up when an unpredicted high wind event occurred. No prescribed fires in natural fuels ("eco-burns") have ever escaped control on the Bitterroot NF.

Within the Lower West Fork project area, 81% of the fires since 1970 were started by lighting and 19% were human caused (FEIS 3.3-8—3-8-10). According to Bitterroot NF fire history, only one human-caused fire originated from debris burning since 1986 (Bitterroot NF GIS database). This fire occurred in 1992, on private land and was $1/10^{th}$ of an acre in size.

LCEC-7: Where is the economic analysis that compares the cost of burning to the cost to our health? The health impacts should not just be an evaluation of hospital visits. It should include the cost of missed sports workouts, young children with asthma with increased costs of medical treatment,

young athletes having heart attacks, children without respiratory disease having bronchitis and having to use inhalers after poor air days, adults with even mild respiratory disease that have to stay inside or miss work when someone is burning slash or conducting prescribed burns.

We have not evaluated health impacts or their costs for two main reasons. The first is because most human health problems listed, (including asthmatic attacks, missed work, missed sports workouts, etc.) are associated more with smoke and particulate matter from either a single large wildfire, or multiple wildfires during fire season inversions, than with prescribed fires or slash pile burning (Ottmar and Hessburg 1996). The second reason is that evaluating healthcare and the other costs would require a long list of complicated assumptions and lead to a purely speculative analysis.

Instead of constructing this type of analysis, the Forest Service mitigates smoke impacts as much as possible. We reduce the size of uncontrollable wildfires through a combination of mechanical thinning and prescribed fire, which collectively reduce the extent and intensity of future wildfires. Furthermore, the plans listed in the Lower West Fork FEIS include managing the landscape with prescribed fires only when air conditions are forecast for good smoke dispersal. The Forest Service applies Best Available Control Technology (FEIS pg. 3.4-5) to limit the production and persistence of smoke in populated areas and reduce the potential health concerns raised above. See also response at LCEC-2.

LCEC-8: …we could create more jobs by cutting the trees and chipping the slash rather than burning it.

Please consider eliminating prescribed burns and the practice of slash burning.

Tree harvest and utilization, and other methods of reducing or treating slash are part of the proposals for each of the action alternatives (FEIS 2-5—2-10, 2-12—2-14). Wood products industries have expressed interest in slash utilization and sales are designed to facilitate this utilization when possible.

However, there is a reason to include prescribed burns as part of the fuel treatments. While Martinson and Omi (2003) reported that fuel treatments of various types reduced crown fire in eight large events, more recent research (Strom 2005, Stephens et al. 2009) has shown that mechanical thinning fuel treatments are not nearly as effective in decreasing fire intensity and spread as the combination of thinning and prescribed fire in western United States forests. Strom noted that, "prescribed burning without cutting was associated with reduced burn severity, but the combination of cutting and prescribed burning had the greatest ameliorative effect." (Strom 2005, p. ii).

Stephens et al. (2009) shows the importance of using prescribed fire after mechanical treatments in order to increase the treatment effectiveness of reducing potential fire severity under severe weather conditions. See Response at LCEC-5.

The Forest Service would consider contracts for removal of small diameter trees or slash if markets support these contracts (FEIS pg. 2-5, 2-8). There are some portions of the project area where market conditions (even though the project area is within 50 miles of a fuels for schools waste wood boiler, and within 200 miles of a paperboard facility) may prevent utilization of all slashed material. In these areas, pile and/or broadcast burning would be needed to address the purpose and need while meeting Montana slash treatment standards (MT Dept. of Natural Resources and Conservation Rule 36.11.222 and 36.11.223).

- Martinson, E.J., Omi, P.N., 2003. Performance of fuel treatments subjected to wildfires, in: Omi, P.N., Joyce, L.A. (Eds.), Proceeding Conference on Fire, Fuel Treatments, and Ecological Restoration. Proc. RMRS-P-29. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO. pg.. 7–13.
- Stephens, S.L., J.L. Moghaddas, C. Edminster, C.E. Fiedler, S. Haase, M. Harrington, J.E. Keeley, E.E. Knapp,7 J.D. Mciver,K.Metlen, C.N.Skinner, and A.Youngblood. 2009. Fire treatment effects on vegetation structure, fuels, and potential fire severity in western U.S. forests, Ecological Applications 19(2) (2009), pg. 305-320.

- Strom, B. 2005. Pre-fire treatment effects and post-fire forest dynamics on the Rodeo-Chediski burn area, Arizona. M.S. thesis, School of Forestry, Northern Arizona University, Flagstaff. *In*: Pollet, J. and P.N. Omi. 2002. Effect of thinning and prescribed burning on crown fire severity in ponderosa pine forests, *International Journal of Wildland Fire* **11** (2002), pg.. 1–10.
- https://library.eri.nau.edu:8443/bitstream/2019/252/1/Strom.2005.PreFireTreatmentEffectsAnd.pdf

BA-1: This trail (Piquett Cr. Rd. 49, beyond the closure gate) could be considered for over 50" width OHV's, since it is already wide enough for 2 highway vehicles to pass one another.

Alternative 2 does not appreciably degrade the quality of the ride or the length of it.

While #3 does not appreciably affect BA's currently permitted routes, it does permanently eliminate some possibilities of looping routes together in the future.

This analysis uses the current definition for motorized use. The travel management analysis currently in process is the arena for considering different definitions or classes of OHVs. The roads past the closure gate on NFSR 49 are proposed as open seasonally to vehicles 50" or less in the travel planning project Alternative 1.

Road management is the same in Alternatives 2 and 3 in the Castle Creek drainage, beyond the gate on NFSR 49. The same roads are proposed for decommissioning or storage. The only road management that would permanently eliminate road use possibilities would be the decommissioning of NFSR 74607. Roads that are stored can be re-opened if needed for future management or administration. If a future NEPA decision determines NFSR 74606 needs to be extended to create a loop, the road would be re-opened.

BA-2: …hope is that there could be a loop created--enough to make the ride a little longer.

Near the upper end of Road 74606 is a posted (closed) trail that could be considered for a Loop…. The feeling is that it could be joined with Trail #49 to created approximately a 5 mile loop.

NFSR 74606 is slated for storage. This road is currently operated as a trail, meaning it is closed to full size vehicles yearlong, and open to ATVs or motorcycles seasonally, 12/02 to 10/14. During public involvement for the Lower West Fork project, the Forest Service presented this road to the public as changing from its current designation to closed yearlong to all motorized vehicles; essentially, it would be placed into long term storage. This road, as it is currently constructed, would be available for future use but would require NEPA analysis for any additional construction needed to create a loop. This decision does not prevent that potential use.

BA-3: support closures of roads that contribute to stream degradation.

FR 74606, located in Castle Creek, is listed in both Alternative 2 and 3 for storage (FEIS pg. 2-31, 2-35, 3.6-23, 3.6-31). This road is included in both alternatives because compaction of the road surface is reducing runoff infiltration and retarding vegetation recovery, is in an area that burned in 2007, has high road densities, and is not needed for forest management in the near future. Although there may be no visible sediment trails from the road to streams, compaction of the road surface increases and concentrates runoff, increases erosion (on and off the road surface), and reduces vegetation growth. See also the response to comment LTPM-6 below.

BA-4: …I do not believe wildlife is impacted by the roads or the travel on those roads.

The purpose of proposing roads for storage or decommissioning in this analysis was to reduce sedimentation and improve fish passage by reducing road densities and the number of road-stream crossings (FEIS 2-5, 2-12, 2-15). Additional road closures were analyzed in the FEIS to meet or improve Elk Habitat Effectiveness (EHE) in the six watersheds that do not meet the EHE. (FEIS pgs 3.8-15, 3.8-16, 3.8-20, 3.8-21). Scientific studies have documented the effects of roads on wildlife since 1976 (Gruell and Roby 1976). Subsequent research has refined the initial correlations with volume of traffic, types of use, and other factors (Papouchis et al. 2001, Mace et al. 1996, Naylor et al. 2009).

LTPM-1: timber… the chief component of the homes of most of us and a product which continues to grow and support the Montana economy.

The Forest Service recognizes the importance of wood and paper products to Missoula and Ravalli counties, as well as the state, regional and national economies (FEIS 3.13-4). This project would contribute wood products from national forest system lands to the local economic impact area.

LTPM-2: I believe today we have a much better understanding of land treatments and methods of harvest than were practiced in the 60's thru the 90's. The forests can be harvested and still remain a national treasure that we can be proud to own.

The proposed project is suitable and appropriate for timber harvest (FEIS pg. 3.2-4)

LTPM-3: Great improvement in machinery no longer require nearly the road systems as before…

I believe the gate system is less costly and in fact these roads have already been bought and paid for …

It is true that changes in machinery have changed transportation system needs. Roads proposed for storage or decommissioning often have open roads nearby that provide motorized access to within a few hundred feet of the stored or decommissioned road. Roads no longer needed for management of timber or other resources are proposed for decommissioning. Roads needed for future timber management but not for current resource management are proposed for storage. Decommissioning roads no longer needed for current or future resource management decreases long-term sediment production (FEIS 3.6-8, 3.6-18, 3.6-19). The Montana Department of Environmental Quality lists the West Fork of the Bitterroot River as Total Maximum Daily Load impaired. Properly storing and decommissioning roads reduces non-market costs (damage to water quality and fisheries) by reducing sedimentation from roads. Decommissioned roads no longer require periodic maintenance, which reduces the overall cost of managing the Forest Service road system. In addition, the gate system is not always effective in managing motorized vehicle use. People damage or drive around gates, and disregard the posted regulations. Law enforcement and the repair of gates and signs, are costs incurred when managing gated road systems that are not incurred when roads are decommissioned. See also, the response to BA-3, above.

LTPM-4: I do continue to object however to the areas on the maps slated for road decommissioning. In some cases these roads provide a secondary escape route in the event of fire for crews. …You must remember the reintroduction of fire will be an ongoing event and still remains a danger if the area is cut off from reasonable management methods.

All of the roads proposed for decommissioning are ends of road segments. These roads would not be used as a secondary escape route because they do not lead out to any other roads. The Forest Service does not compromise firefighter safety by decommissioning these roads. If an escape route is not available, firefighters will not engage the fire until one becomes available. In some instances, firefighters may have a longer hike into a fire because a road was decommissioned. During the reintroduction of fire, an analysis of fuel moistures and weather conditions will be conducted before deciding to manage an unplanned ignition for resource benefit. The road network remaining after Lower West Fork project implementation will be adequate to provide fire managers multiple options when looking at reintroducing fire to the landscape.

LTPM-5: Also in some cases these road provide hunting opportunities into areas that are used.

Restoring fire to the landscape and improving soil, watershed, and fishery conditions were the purpose and need for the Lower West Fork project. Improving soil, watershed, and fisheries conditions were the driving factors when proposing roads for storage or decommissioning in this analysis (FEIS 2-3 thru 2-4, 2-8, 2-15). Although 29 miles of roads would be either decommissioned or stored in Alternative 2 and 46 miles in Alternative 3, more than 50 miles of roads would remain open yearlong to all motorized users in the analysis area (FEIS 3.12-12). Most of the hunting use in the Lower West Fork analysis area is concentrated

on the Piquett Creek drainage (FEIS 3.12-3) where road density is high and EHE is marginal. The roads remaining open will be adequate to provide hunting opportunities.

LTPM-6: in most cases (roads) do not contribute to any great degree much silt into our streams. Our fish population can withstand much more silt than we are led to believe.

Fish have always had to live with sediment because sediment is a natural feature of all stream systems. The source (natural versus man-made), timing (constant versus pulsed), and quantity (low versus high) of the sediment makes a big difference to fish. Roads generally do not contribute large amounts of sediment to fish habitat on any given day; however, they are a permanent feature on the landscape and prone to erosion. Because they are permanent and erosive landscape features, roads erode, increase overland runoff, and add sediment to streams above the natural sediment load of the watershed any time a rain storm occurs. Therefore, more sediment enters fish habitat than would naturally occur in an unroaded watershed; this sediment builds up over the years and degrades fish habitat (Furniss et al. 1991). The point is that roads continue to contribute elevated (above natural levels) amounts of sediment as long as they are present on the landscape. This is known as a "press disturbance" because the disturbance is chronic and maintains fish habitat in a less than desired condition as long as the roads are present (Reeves et al. 1995). Burned hill slopes, by contrast, generate a very high pulse of sediment for 2-3 years, but erosion rates typically decline to pre-fire conditions within 5 years (Elliot and Robichaud, 2001). This is a "pulse disturbance." Fish withstand pulse disturbances better than press disturbances (Reeves et al. 1995). Finally, the Fisheries Biologist does not know of any scientific literature that supports the assertion that roads are beneficial to fish habitat. At best, they can be built in benign locations (e.g. ridges, upland slopes with no stream crossings) and have a neutral effect on fish habitat. The vast majority of the scientific literature clearly shows that roads have a negative effect on fish habitat. Furniss et al. (1991) provides a good summary of road sediment research and lists numerous studies and authors.

LTPM-7: I support as you know any and all forest management efforts using our new understanding of forest needs and the prevention of stand replacement fires

The Forest Service appreciates your support. As you are aware, forest management embodies not only the trees of the forest but the other vegetation and fauna that inhabit the particular forest ecosystem, and the streams and soils that support them. This analysis applies current science to evaluate forest resource conditions (FEIS 3.6-4 through 3.6-7, 3.7-10), estimate environmental effects (FEIS 3.6-16 –3.6-21, 3.6-29, 3.7-10 –3.7-20, 3.7-29) and provide forest management recommendations (FEIS 2-17, 2-18, 3.6-38 – 3.6-40).

CT-1: I have very serious concerns, however, that neither the preferred alternative nor either of the other alternatives fully analyzed in the DEIS will achieve these stated goals…. I have provided comments and a silvicultural prescription which will achieve the desired results.

How the alternatives achieve the purpose and need are summarized in the FEIS on pages 2-5, 2-12, 2-15, and 2-16, respectively, and described in more detail on pages 3.2-26 – 3.2-32. Thinning from below to a stand density determined by site capability and selecting to leave shade-intolerant tree species would reduce fuels, leave the larger trees on the site, and increase the distance between tree crowns. Removing small trees in the understory raises the base canopy height of the stand and prevents surface fire from moving into the tree crowns. The larger, shade-intolerant tree species that make up the stand following treatment have had more time to develop fire-resistant bark and withstand insect attacks or disease infections. Increasing the spacing between tree crowns, provides more growing space for the remaining trees to improve their vigor and put more energy into developing their defense mechanisms (FEIS pg. 3.2-26—31).

CT-2: I request that the FS analyze my silvicutural prescription as a separate, proposed alternative or, failing that, the FS incorporate my harvest prescription and as many of my comments as possible into the alternative that is ultimately selected by the FS.

There is no need to analyze this prescription as a separate alternative. This prescription is incorporated in both Alternatives 2 and 3 on appropriate sites (FEIS pg. 3.2-18—3.2-20). The harvest prescriptions are also incorporated as allowed by law and regulation (FEIS pg. 2-8 –2-10, 2-15 – 2-17, A-4–A-7).

CT-3: …the USFS will need to prioritize all mitigation factors in a descending order of importance.

Mitigation measures are mandatory, design features of the project. Their application is not optional, therefore, they do not need to be prioritized. Rehabilitation projects not directly associated with timber harvest but included in this analysis are optional and their priority is based on funding sources beyond the current timber sale. For example, the mitigation measure to reduce soil erosion, and prevent stream sedimentation and noxious weed spread in timber harvest units requires the timber sale administrator to evaluate disturbed sites and consult with the resource specialists to determine the erosion control and revegetation needs. The practices that could be applied, as dictated by the needs of the site, include recontouring, shallow ripping, seeding, fertilizing, shrub planting, and covering the soil with mulch or slash (FEIS pg 2-18). These practices would be accomplished as part of the timber sale.

Rehabilitating historic skid trails in Unit 2 that would not be used as part of this project is an example of a project that would not be "mandatory" and would require appropriated funds or other funding sources for it to occur. However, because the ID Team analyzed the effects of sub soiling these trails in this analysis, the project would not need additional NEPA analysis for it to proceed.

CT-4: Reduce the BAF to 40-80 (10 foot between crowns absolute minimum crown closure) in a varied mosaic including the removal of large and small trees favoring retention of the larger, healthy trees. All treatment methods that meet the Purpose and Need and that can be safely operated, as is normal industry practice, shall be allowed (see Mimicking Nature's Fire by Arno and Fielder). Ground based systems should be preferred. Care shall be taken to remove as many of the limbs and needles as possible to reduce the fuel loading. Areas may be clumped, thereby creating openings that break the fuel continuity. Specifically, large PP that have overlapping canopies may be retained in groups with no skidding under those crowns. Openings shall be created next to such clumps to average the BAF for the area.

The silvicultural prescription you described is appropriate in mature ponderosa pine dominated stands and will be implemented with minor variations under Alternatives 2 and 3 (FEIS pg. 2-8, 2-9, 2-13). In other stand types with different historical fire regimes or in younger stands, different prescriptions are warranted (Arno and Fielder 2005). The prescriptions and harvest methods are designed to balance resource management needs with efficient timber harvest and applicable laws and regulations.

Some limbs and needles are necessary to leave on the ground for nutrient cycling. The ID Team expects that needles, branches, and tops will break out of trees during harvest. This material will be left in the treatment units as needed for nutrient cycling and the prescribed fire treatment. Refer to the discussion on nutrient cycling in the FEIS pages 3.5 -13 – 3.5-14.

CT-5: All trees with two or more bug hits shall be removed as biomass.

Trees with bark beetle attacks around 2/3 circumference would be removed. Verification of attacks would be based on frass at the base of trees or in bark crevices (Hagle, S.K., K.E. Gibson, and S. Tunnock 2003). Presence of successful pitch tubes would be another indicator.

Unhealthy, excess trees will be marked for removal first. Whether they are removed as wood products depends on economic and technical feasibility. In general trees greater than 6.5" dbh qualify for removal as wood products.

CT-6: All chimneys that adjoin the private must have at least two breaks in the fuel continuity.

Within the Lower West Fork project, there are no chimneys located below private land so fire would not be funneled uphill towards people or private land values. There are areas within drainage bottoms that adjoin private land that will be left untreated by mechanical means because they are Riparian Habitat

Conservation Areas (RHCAs). The fisheries mitigation measures (FEIS pg. 2-19 –2-21) describe the management limitations within RHCAs. The proposed action addresses reducing the potential fire behavior within these areas by allowing small tree thinning to within 50 feet of streams and the use of hand ignited prescribed fire within RHCAs.

CT-7: Snags shall be retained at a density of 1.5-3 per acre average or less.

All snags that do not present an Occupational Safety and Health Administration (OSHA) hazard would be left on site.

CT-8: Alternate thickets of small trees shall be retained and removed as necessary to meet the BAF specifications while also providing habitat for smaller wildlife. Particular care should be used to avoid the corn field effect.

This silvicultural prescription is appropriate in even-aged ponderosa pine stands when regenerating a portion of the stand is desirable. This prescription creates younger cohorts and moves the stand closer to an un-even aged structure (Arno and Fielder 2005). This prescription, with the addition of prescribed fire, is proposed in appropriate stands under Alternatives 2 (FEIS pg. 2-8, 2-9) and 3 (FEIS pg. 2-13).

CT-9: …care shall be taken to avoid impact or damage to retained trees during the reintroduction of fire.

The reintroduction of fire will be conducted under such conditions that tree mortality is within the limits set by the silvicultural prescription (FEIS pg. 2-10, 3.2-28). In some units prescribed fire may be used to recruit snags and create coarse woody debris. Various techniques may be used to protect residual trees such as ignition patterns and timing, and pulling slash and raking duff from the base of trees.

CT-10: Additionally, no large brush piles or concentrations shall remain on the treatment area at the conclusion of the treatment.

Landing piles would be removed through utilization or by prescribed fire when conditions make it safe and effective to do so. This means that piles may remain 1-5 years following harvest. Slash piles on the Frazier Interface Timber Sale were burned within three years of the sale closure and slash piles on the Middle East Fork HFRA project are burned when the units close.

CT-11: All ground based off-road operators shall complete a soil moisture test on a daily basis or anytime varying soil moisture conditions exist.

Prior to the start of logging operations, timber sale administrators assess soil moisture conditions. Ground skidding can take place when soil moisture is at or below the permanent wilting point. Vegetation characteristics can be used to determine if soil moisture is near the permanent wilting point. Vegetation should have little active growth and will be nearly senesced. If visual observations of vegetation do not provide enough information, the soils can be assessed directly by grabbing a handful of soil and squeezing it in the palm. Dry soils should crumble or deform when the palm is opened. Soils that retain shape after squeezing contain enough moisture to increase the ability of the soil to become compacted. Refer to the soil mitigation practices for ground-based yarding (FEIS pg. 2-18 –2-19), which are discussed on pages 3.5-14 through 3-17 and 3.5-25.

CT-12: THE VEGETATIVE PRESCRIPTION SHALL ALSO BE APPLIED IN THE RIPARIAN AREAS…. conifers,…must be removed to restore the natural function of the stream and its vegetation. The USFS shall follow the Montana BMPs to accomplish this. Aspen restoration must be a priority as well as beaver reintroduction neither of which are emphasized in the DEIS. The USFS shall follow the Montana BMPs

Applying the vegetative prescription in riparian areas in the Lower West Fork project area would violate the Forest Plan. The Forest Plan, as amended by INFISH, prohibits timber harvest in Riparian Habitat Conservation Areas (RHCAs) with two exceptions:

- (1) where catastrophic events such as fire, floods, volcanic, wind or insect damage result in degraded riparian conditions and present and future woody debris needs are already being met; or
- (2) where vegetative treatments are needed to attain the Riparian Management Objectives (i.e. pools, large wood, cold water temperatures, and narrow stream channels).

Clearly, exception (1) does not apply to the Lower West Fork project. As for exception (2), timber harvest in RHCAs would not increase pool habitat, increase large wood recruitment into streams, decrease water temperatures, and narrow stream channels in the Lower West Fork project area. In the spruce/fir riparian areas that dominate the Lower West Fork project area, removal of timber is likely to do the opposite, resulting in fewer pools, less large wood, less shade, and less stable stream channels. For that reason, removing timber from the riparian areas would violate the Forest Plan and BMPs (FEIS pg. A-4 –A-8).

While the Bitterroot NF recognizes the need and importance of both aspen restoration and beaver reintroduction, the purpose and need of this project does not focus on these objectives. For the most part, the stream habitat that is present on National Forest land in the Lower West Fork analysis area is not suitable for beaver because most of the streams are steep and have high gradients with narrow riparian corridors and floodplains. Beaver prefer low gradient, meandering streams that contain wide floodplains dominated by deciduous shrubs. In the Lower West Fork project area, suitable beaver habitat is generally restricted to private lands along and near the West Fork Bitterroot River.

Prior to the fires of 2000, which burned over 307,000 acres of the Bitterroot NF, the decline of aspen stands was a concern. After those fires, the Forest Service observed the healthy regeneration and expansion of aspen clones. Based on these observations, the ID Team believes the proposed prescribed fire treatments will continue to restore healthy aspen stand without special emphasis.

Beaver populations appear to be stable and colonizing available habitat. This trend will likely continue as tolerated by private land owners. Maintaining intact riparian areas will promote beaver dispersal.

CT-13: …it is absolutely necessary to prescribe a method for checking the silvicultural prescription during and after the project to determine whether the objective has been met. Specific methods must be written into the final EIS to insure that the silvicultural prescription is met.

Silviculturists supervise the marking on harvest units and monitor the harvest in the units, especially when special circumstances exist in the unit. They document prescription results with post-harvest exams and maintain the results in project files.

Specific methods for monitoring the implementation of the silvicultural prescription do not need to be written in the FEIS because they are administrative functions and would not differ between alternatives. There are many checks on the implementation of the silvicultural prescription through administration of the marking and timber sale contracts, and Forest Plan monitoring at the completion of the sale

CT-14: …there is not a meaningful difference between the two alternatives that were analyzed with respect to the key issues I have set forth above in my comments….By failing to fully assess a range of reasonable alternatives, the FS has avoided its obligations under NEPA to take a hard look at the environmental consequences of its actions

The three alternatives analyzed in the FEIS provide a reasonable range of alternatives that addressed the issues brought up during public scoping and meet the purpose and need of the Lower West Fork analysis area (FEIS pg. 1-2, 1-4, 2-4). Alternative 1 is the No Action alternative and provides a benchmark that enables decision makers to compare the magnitude of environmental effects. Alternative 2 was the proposed action the Forest Service developed to address resource concerns in the project area. Alternative 3 was developed from public comments the Forest Service received through scoping (FEIS pg. 2-12, 2-15). Commercial harvest and prescribed fire use would not occur east of the West Fork River because some people felt that the fires of 2000 and 2007 had reduced fuel loads in this area. Alternative 3 was analyzed

because it addressed the purpose and need and would display the effects of no timber harvest on the east side of the West Fork River on community fire protection.

Several alternatives were considered but not analyzed in detail because they were already part of Alternatives 2 or 3, or they did not address the purpose and need for the project (FEIS pg. 2-16, 2-17).

CT-15: I urge the Forest Service to incorporate as many of my comments as possible into the alternative that is ultimately selected so that the alternative complies with the FS obligations under the law and fully explain why any comment that was not included has been rejected by the FS.

The alternatives analyzed in this project incorporate public comments as described in the response above (CT-14) and in the FEIS pg. 2-3, 2-4). They are consistent with laws and Forest Service regulations (FEIS pg. 3.2-37, 3.3-21, 3.4-13, 3.5-34, 3.6-39 – 3.6-42, 3.7-32, 3.8-60 – 3.8-63, 3.9-11, 3.10-14, 3.10-15, 3.11-5, 3.12-15, 3.13-9, 3.13-10).

SSC-1: Your proposal to address fuel loading, stand health and composition and the other issues within this landscape are worthy ones. It is good to see the Forest take a proactive stance in addressing these needs before catastrophic events such as fire and insect out breaks occur…. I recommend that this project be moved forward.

Thank you for your support.

SSC-2: …it addresses the real threat of wildland fires…. it will improve forest health by removing suppressed and diseased trees…. The FS has as a mandate to manage these lands and the activities proposed does just that. Other benefits from this project include improving transportation systems by addressing BMP's on existing roads and eliminating unnecessary roads. It will also improve wildlife habitat and water quality.

Lower West Fork Alternatives 2 and 3 reduce stand stocking by thinning from below and retaining the larger, seral trees as the dominant stand component (FEIS 2-8). Prescribed fire would be used to further reduce ground and ladder fuels in the commercially thinned stands as well as in units that do not require stand density reduction (FEIS pg. 2-9). Road improvements have also been included in the action alternatives (FEIS pg. 2-8, 2-12, 2-18, 3.6-21, 3.6-22, 3.6-30, 3.6-31).

SSC-3: Smurfit-Stone can utilize these small trees as we can chip them up to use in our paper-making process. Additionally, there is the opportunity to grind the left over slash which can be burned in our boiler creating steam and electricity for our use…. it is important to provide material close to our mill which this project does.

Prior to the announcement of the mill closing, Smurtfit-Stone contacted the West Fork Ranger District to describe their interest in accessing chips and slash from the relatively proximate Lower West Fork project (PF-PUB-INV-31). There will be small-diameter utilization opportunities associated with this project. However, due to terrain and road limitations, some areas will not support landings large enough to allow chip van access. If market conditions permit, some material in these areas may be mechanically handled more than once, allowing utilization above what is currently anticipated.

SSC-4: I would recommend including more ground based areas to help offset the higher cost skyline units.

Ground-based yarding is limited to slopes less than 40% to protect soil resources (Bitterroot NF Forest Plan FEIS pg IV-43, A-4). Treatment units were chosen that would meet the purpose and need of fuel reduction on a landscape basis (FEIS pg. 1-2). Ground-based area is 42 percent of the harvest area in Alternative 2 (FEIS pg. 2-16) and 46 percent in Alternative 3 (FEIS pg. 2-16).

FOB/WWI-1: Alternative 1 (no action), with the addition of restoration activities that would remove manmade impediments to natural recovery, could approximate this approach. The road restoration and culvert work described in Alternative 3 addresses that issue better than that in Alternative 2.

The Alternatives present a range of activities from which the decision maker can review and select. The range of activities chosen in the Record of Decision may contain a mix of activities presented and analyzed in the DEIS (40CFR 1505.1(e)). For example, the Deciding Officer may choose Alternative 1 but decide to include the road and culvert work analyzed under Alternative 3 because the effects of both activities are disclosed in the analysis. And, their combined effects would be within or less than the range of effects described in the EIS.

An alternative that included road and culvert work but no vegetation treatment was considered but not analyzed in detail. Because road and culvert work is analyzed in Alternatives 2 and 3 (FEIS pg. 2-8, 2-12) and no vegetation treatment is analyzed in Alternative 1, another alternative analyzing their separate effects was not needed. An alternative that considered no vegetation treatment would not address the need to reduce fuel loads, improve the resilience of large diameter ponderosa pine, or maintain or improve the representation of shade-intolerant species in the stand (FEIS pg. 1-2, 2-15).

FOB/WWI-2: We fully support the proposed watershed restoration activities and believe much more is required in many areas to allow future logging to occur within legal limitations.

Thank you for your support regarding watershed restoration. The Water Quality Restoration Plan and Total Maximum Daily Loads for the Bitterroot Headwaters Planning Area, "Restoration Plan" (Montana Department of Environmental Quality 2005) lists the West Fork River as impaired because of siltation and temperature modification (FEIS pg. 1-4, 3.6-1, 3.6-2, 3.6-4, 3.7-6, 3.7-9, 3.7-10). The Restoration Plan recommends that sediment from roads be reduced (FEIS pg. 1-4, 3.6-1, 3.6-2). None of the tributaries to the lower West Fork River are listed as 303(d) impaired within the project area. The timber harvest proposed in this analysis is within legal requirements (FEIS pg. 3.6-39 thru 43). The ID Team, representing soils, watershed, fisheries, silviculture, fire, recreation, wildlife, travel planning, and logging systems, evaluated each road and cooperatively developed the restoration activities in Alternatives 2 and 3 based on resources at risk, future transportation needs, as well as past, present, and future resource needs (PF-WAT-36).

Through proper application of roads and trails and timber harvest BMPs (FEIS Appendix A), sedimentation from the proposed timber harvest would be negligible (FEIS pg. 3.6-20, 3.6-21, 3.6-29, 3.6-30, 3.7-13 – 3.7-21, 3.7-30). Mandatory stewardship activities as discussed in the FEIS are those activities included in the stewardship contract and funded by the timber sale. Other stewardship activities analyzed in the FEIS are not directly tied to timber harvest but are connected to the analysis and would be completed as funding becomes available. The mandatory stewardship activities listed in the FEIS and hydrology specialist report (FEIS pgs.PF-WAT-31 pg. 3.3-28, 3.3-36, and 3-37) would decommission or store nine roads (11.6 miles) and remove 15 culverts in Alternative 2. These actions would reduce annual sediment yields by an estimated 18.7 tons/year. Under Alternative 3, mandatory stewardship activities would decommission or store 11.8 miles of road and remove 18 culverts, which would reduce annual sediment yields by approximately 20.4 tons/year. The ID Team identified the mandatory restoration opportunities that would provide the greatest benefit to aquatic resources. They also selected the projects that could be accomplished within the period of the stewardship contract, or earlier with appropriated or partnership funds. The implementation of these restoration activities would offset any potential sediment inputs resulting from fuel management activities, reduce long-term sediment inputs, and improve water quality in the Lower West Fork analysis area as recommended in the Restoration Plan (See also FOB/WWI-28).

For hydrologic units in the Lower West Fork analysis area, there would be a reduction in the number of culverts, sediment contributing points, from the implementation of the mandatory items as well as the entire improvement package. The mandatory and complete improvement package would move the resource toward attaining the Restoration Plan recommendations. Table 1 displays the sediment reductions in the hydrologic units under Alternatives 2 and 3.

Table 1: Sediment Reduction in the Lower West Fork and Piquett Hydrologic Unit Codes (HUCs) in the Lower West Fork Analysis Area

	Alternative 2		Alternative 3	
	Lower West Fork HUC	**Piquett HUC**	**Lower West Fork HUC**	**Piquett HUC**
Existing estimated sediment from culverts (1.7 tons/culvert)	190 tons/year	165 tons/year	190 tons/year	165 tons/year
Total Reduction of annual Sediment contributions	15 tons (8% decrease)	12 tons (7% decrease)	15 tons (8% decrease)	24 tons (15% decrease)
Annual reduction of sediment contributions from mandatory stewardship activities	10 tons (5% decrease)	9 tons (6% decrease)	10 tons (5% decrease)	10 tons (6% decrease

Soil rehabilitation activities have been proposed in commercial thinning units to address past soil disturbances. Skid trails from previous timber harvest entries would be re-used in ground-based logging units to reduce new soil disturbance (FEIS pg. 2-18, 3.5-12, 3.5-16). Skid trails used to yard timber during harvest would be decompacted by subsoiling (FEIS pg. 2-11, 2-18, 3.5-16, 3.5-18). Commercial thinning units that currently exceed the Region 1 Soil Quality Standards (R1 SQS) will have a net improvement in soil quality following thinning and soil rehabilitation treatments (FEIS 2-11, 2-25, 3.5-25). If other treatment areas are selected for future projects, past soil disturbances will be addressed to ensure R1 SQS are met.

FOB/WWI-3: We disagree with the rationale for the supposed need to remove fuel beyond the Home Ignition Zone (HIZ) or Community Protection Zone (CPZ) for the purpose of protecting human safety or private property.

The purpose of the Lower West Fork Project is to reduce fuel loads in and adjacent to the WUI and improve forest resilience to natural disturbance factors such as fire, insects, and disease (FEIS pg. 1-2, 1-4). One of the objectives is to lower crown fire hazard in low elevation ponderosa pine/Douglas-fir forests (FEIS pg. 1-2). Though the Forest Service recommends and encourages the removal of fuels within the Home Ignition Zone to reduce the probability a home would burn during a wildfire, that action is not enough to meet our purpose and need of lowering crown fire hazard and improving forest resilience in the Lower West Fork project area

In a recent issue of Forest Management and Ecology, Safford et al. found that "with a few exceptions, fuel treatments substantially moderated fire severity and reduced tree mortality during the Angora Fire" (Safford 2009 pg. 14). Safford also stated, "in most cases, crown fire was reduced to surface fire within 50 m of the fuel treatment boundary; when combined with other considerations, we conclude that 400–500 m appear to be an absolute minimum width for most WUI fuel treatments" (Safford, 2009, p14). Treatments in the Lower West Fork project area extend about 1500 meters.

Forest vegetation in the Lake Tahoe Basin (LTB), though different, has many similar characteristics to the vegetation in the Lower West Fork analysis area. The Angora Fire burned in the LTB WUI during June 2007. Forest vegetation on 83 percent of the pre-fire area was Jeffrey pine (Pinus jeffreyi) and white fir (Abies concolor) at the lower elevations (Safford, 2009, p2). Jeffrey pine is similar to ponderosa pine because it is a shade intolerant, fire adapted species. White-fir is similar to Douglas-fir because it is shade tolerant, regenerates in the understory, and is susceptible to fire-caused mortality. Safford (2009) states, "Pre-settlement fire return intervals in the LTB probably averaged 5–20 years in Jeffrey pine-dominated forests (Stephens 2001,Taylor and Beaty 2005). As in much of the Sierra Nevada, active fire exclusion in the LTB has nearly eliminated fire as a natural ecological process. In addition, a large proportion of the Lake Tahoe Basin (including much of the Angora Fire area) was heavily logged in the late 19th and early

20th centuries. Together these factors have increased stand density, canopy cover, and surface fuels (Murphy and Knopp 2000; Taylor 2004)."

- Safford, H.D., et al., 2009. Effects of fuel treatments on fire severity in an area of wildland–urban interface, Angora Fire, Lake Tahoe Basin, California. Forest Ecol. Manage. (2009), doi:10.1016/j.foreco.2009.05.024

FOB/WWI-4: …perhaps NEPA analysis should be given to forest-wide amendments to the Forest Plan regarding these standards. That analysis would provide a larger scale, more comprehensive and updated assessment of the various situations not available with the piecemeal approach now being used.

The 1987 Forest Plan specifically allows for site-specific amendments "If, during Forest Plan implementation, it is determined that the best way to achieve the prescription for a management area does not totally conform to a management prescription standard, the Forest Supervisor may amend that standard for a specific project." (p. IV-5).

Appendix F, Forest Plan Amendment, analyzes the direct, indirect, and cumulative effects of the amendment, and the assessment of whether or not it is significant.

FOB/WWI-5: We would like to see protection of all large standing snags.

No snags would be cut in treatment units unless they are designated "danger" trees. Snags designated as "danger trees" within treatment units are managed according to Occupational Safety and Health Administration (OSHA) regulations (29CFR 1910.266(h)(1)(vi) and (vii)).

FOB/WWI-6: <u>Winter Range Thermal Cover</u> standard… is totally elastic, designed, a priori, to fit any desired timber removal. As such, it appears to be arbitrary regarding protecting elk…. this standard should be evaluated in light of protecting elk security from wolves.

There is an inherent conflict between the thermal cover standard on winter range in the Forest Plan and the need to restore high frequency, low severity fire regimes on winter range. Historic forest stand structures in winter range were typically open-grown ponderosa pine and Douglas-fir/ponderosa pine stands (FEIS pg. 3.8-21). Winter range thermal cover is defined as "a stand of coniferous trees 40 feet or taller with an average crown closure of 70 percent or more (Forest Plan 1987). Most of the habitats that make up winter range on the Bitterroot NF are incapable of producing or sustaining the canopy closures that provide thermal cover (FEIS pg. 3.8-14, 3.8-20, 3.8-24). Reducing stand densities to 80 ft^2 of basal area or less would reduce canopy closure below 70 percent. In order to address this, a site-specific amendment to the Forest Plan concerning winter range thermal cover must be adaptive and maintain cover on Lower West Fork treatment units but allow the removal of ladder fuels and excess stocking that predispose the units to crown fire. To clarify the intent of the Forest Plan amendment, the ID Team revised it to read, "Thermal cover on winter range will be treated in the Lower West Fork analysis area to the extent needed to protect the overstory from loss due to fire." (FEIS pg. 1-11)

Cook and others (1998) have researched the role thermal cover plays in the winter survival of elk, and question the necessity of managing forests in order to provide such habitat. Thermal cover is apparently not as necessary for individual elk survival or elk population viability. Though this project would thin the overstory, it would not remove it entirely and some site protection would remain. However, the remaining site protection may not fit the definition of winter range thermal cover. The loss of up to five percent winter range thermal cover would not likely have a measurable effect on the elk population in the Lower West Fork or the Bitterroot Valley (FEIS 1-11, 3.8-14, 15, 21, 24-25).

Winter range thermal cover is not designed nor could it be designed to protect elk from wolf predation or pressure. Thermal cover is a habitat feature related to vegetation structure that modifies the effects of weather (Toweill and Thomas 2002). Thermal cover is largely a function of canopy closure and focuses on

protecting the elk from snow in the winter and sun in the summer, wolf predation would not be affected by this feature.

FOB/WWI-7: Given that the EHE standard regarding road density (security from human hunters) is not being met and can not be met in parts of the project area according to DEIS p.1-12, it would seem especially important to allow for more security from wolves, by leaving "thermal cover" where it exists, especially near meadows, within the project area.

Elk habitat effectiveness (EHE) is a measure of elk habitat use based on consistent evidence that elk do not fully use habitat adjacent to roads though habitat is available (Lyon 1983). Elk security is a measure of elk vulnerability during the hunting season and its purpose is to provide a reasonable level of bull survival (Hillis et al. 1991). EHE presumes an elk behavioral response conditioned by vehicular traffic on forest roads (Lyon 1983). Hiding cover may mitigate the negative response elk have to roads but effective road closures may be the best method for elk attaining full use of the habitat. Seasonal road closures contribute to elk security because they limit vehicular, and thereby hunter, access.

The Wildlife Biologist reviewed the EHE analysis in the FEIS to ensure our assumptions complied with Forest Plan direction. The Forest Plan directs that EHE of 50 percent or higher (Lyon 1983) be maintained in currently roaded third order drainages (Forest Plan pg. II-21). The year-round closure of NFSR 5630 would bring the Lavene drainage into EHE compliance. However, this road is open only during the summer when elk habitat is at a premium and people use the road for wood gathering and berry picking. The main road in the Violet-Applebury drainages, NFSR 5720, accesses the Rombo Ridge Trailhead. The other roads are closed to all vehicles during the hunting season. Under alternatives 2 and 3, 02e424-2 (Baker Creek) meets the EHE standard; EHE improves in 02e424-1 (Lavene Creek) and 02f427-3 (Wheeler Creek), and remains the same in 02h449-2 (East Piquett), 02h450-2 (East Main Piquett), and 02i450-1 (Violet Creek) (FEIS pg. 3.8-16). Over the whole Lower West Fork analysis area, year-round open road densities would decrease to 2.2 miles per square mile in Alternative 2 and 2.0 miles/square mile in Alternative 3 (FEIS pg 3.8-26). During the hunting season, road density drops from 1.4 miles per square mile (Alternative 1) to 1.2 miles per square mile in Alternative 2 and 1.0 mile per square mile in Alternative 3 (FEIS pg 3.8-26).

Fifty-three percent of the Lower West Fork analysis area provides elk security habitat, which is more than adequate according to Hillis and others (1991). Cover in general is a factor in elk security but it can be hiding or thermal cover. Thermal cover and hiding cover are different concepts in elk habitat management (Ormiston 1978) and the focus of hiding cover is protecting elk from human hunters not wolves (Toweill and Thomas 2002). Thermal cover as defined above in FOB/WWI-6 would not affect wolf predation. The Lower West Fork project proposes to thin stands, which would leave forest canopy in the treated units though not enough in some areas to qualify as thermal cover. The intention of the treatments is to reduce the potential loss of cover from fire (FEIS 1-5–1-7). The fires in 2000, the Rombo fire, and the Douglas-fir beetle outbreak reduced cover on the Bitterroot NF.

Wolf and elk have co-evolved and elk are capable of evading wolf predation. Forest canopies, though thinner, will remain intact following treatment. The forest will still intercept snow and reduce snow depths beneath the canopy. The habitat components that allow elk to evade wolf predation would remain intact following unit treatments. No treatment design would protect elk from predation by wolves.

FOB/WWI-8: The FEIS must disclose the recently available spring 2009 elk count numbers, which show a significant decline from the 5,950 elk in 2008, which shows a significant decline from the 8,169 elk in 2005. As the LWF DEIS admits (p.3.8-21), "No management activity can replace hiding cover in the immediate future".

Spring elk counts for 2009 are disclosed in the FEIS (FEIS pg. 3-14). The elk count in the Bitterroot Valley is 6,166, which is an increase from the count in 2008 but a decrease from 2005. The elk population objective for the Bitterroot Valley, set by the State of Montana, is 6,200, ranging between 5,000 and 7,400

animals based on the Spring count. Although elk numbers are decreasing in portions of the valley, the total number of elk meets the population objective; the population is less than record highs counted in 2003, 2005, and 2006 but higher than historic numbers. During the record high years, elk hunting seasons were liberalized to bring populations to or below state objectives by 2009 as mandated by State Statute 87-1-323. The liberal hunting seasons along with growing predator populations have contributed to the decreasing elk population.

The context of this comment implies that the elk population decline is related to low EHE, or lack of thermal or hiding cover and that these habitat characteristics somehow tie to wolf predation of elk. As stated above, the elk population decline is most likely due to the liberal hunting season quotas intended to reduce population and meet state population objectives (Hamlin and Cunningham 2009).

FOB/WWI-9: Lumping all wood 3 inches and larger into one category, CWD, does not distinguish the huge differences in fire behavior, soil building, moisture retention and wildlife values between a 3 inch branch and a 30 inch log… Generally this failure to make important size distinctions leads to accumulating damage from loss of the more ecologically important larger logs and boles.

The discussion of coarse woody debris (FEIS pg. 3.5-13) identifies the value of coarse woody debris greater than 15 inches diameter and the need to leave it on site to the extent possible. The ID Team recognizes that larger coarse woody debris is desirable to minimize fire behavior and promote long-term soil building and have included this recommendation in the mitigation measures (FEIS pg. 2-19).

FOB/WWI-10: The FEIS should include analysis and disclosure of potential impacts of prescribed burning, especially in spring, to ground nesting birds or animals and impacts on plants, especially rare or sensitive plants. Spring burning goes against the rhythm of fire season and fire cycles that have shaped the forests and associated components over many thousands of years. It stands to reason that there are unforeseen and unintended consequences.

Fire exclusion allowed the build up of fuels and changed the components and character of the forests, which increased the intensity and severity of wildland fires (Graham et al. 2004). Fire exclusion has also changed the fire rhythms and cycles. Given the high fuel loads and the density of development adjacent to the forest, allowing unplanned ignitions to burn during the fire season without some prior reduction in fuel loads is not feasible (FEIS pg. 3.3-12).

The effects of prescribed fire on sensitive plants is included in the FEIS (FEIS pg. 3.10-10). Effects on land birds, including ground nesting birds are disclosed in the FEIS on pages 3.8 -57 and 3.8-58. While there may be impacts on individual animals and plants, the limited extent of annual prescribed fire use would not cause any species declines. Saab et al. (2007) found that the influence of fire on both migratory and resident birds appeared to be short-term. Migratory bird response to prescribed fire was more variable, while resident birds generally had a positive or neutral response. Ground nesting birds typically favored burned habitats and had neutral responses to prescribed fire. There are areas with similar habitat conditions that would provide nesting or re-nesting habitats. Using prescribed fire as a tool to reduce fuels would ultimately allow some unplanned ignitions to burn more frequently during the typical fire season.

FOB/WWI-11: Proposed 'temporary' roads need to be shown on a map in the FEIS.

Temporary roads and TLM trails are added to the Alternative maps.

FOB/WWI-12: The effectiveness of R-1 SQS needs validation monitoring to see if it leads to protecting soil conditions that truly satisfy NFMA requirements.

To our knowledge, the R-1 SQS has never received public review and comment nor has it been peer reviewed. It seems to have been simply adopted by fiat. Please disclose substantiation by scientific reports.

…the USFS uses the surrogate measurement of Detrimental Soil Disturbance (DSD). The accuracy of the supposed linkage of this substitution has not been adequately evaluated or disclosed….That

standard is totally inadequate; it throws the gate wide open. No amount of existing, logging-legacy, soil damage would preclude reentry for more logging.

The Bitterroot NF Plan adheres to the Regional soil quality guidelines to ensure soil resources are sustained. Soil properties including infiltration, water holding capacity, and filtering capabilities will be maintained if less than 15% of an activity area has been detrimentally disturbed.

The Forest is bound by Forest Plan direction to "plan and conduct land management activities so that reductions of soil productivity potentially caused by detrimental compaction, displacement, puddling, and severe burning are minimized" (BNF Forest Plan II.25 (7). This is being accomplished through project design and mitigation (FEIS pg. 2-11, 2-18, 2-19, 2-15, 3.5-11, 3.5-26 thru 3.5-28), and the implementation of BMP's (FEIS, Appendix A). Bitterroot NF Forest Plan II-25(8) also states "Plan and conduct land management activities so that soil loss, accelerated surface erosion and mass wasting, caused by these activities, will not result in an unacceptable reduction in soil productivity and water quality." Again, this is accomplished through project design, mitigations, and the implementation of BMP's.

Powers et al. (2004) concludes that any standards await validation and will be updated as findings come in from research. Also, this issue is being reviewed at the national level with assistance from the research community (M Webster and D Page-Dumroese, personal communication).

There is literature to substantiate using the soil quality standards as surrogates for soil productivity (Page-Dumroese et al. 2000; Meurisse 1987; Powers 1990; Cline and Ragus 1998). Powers (1990) (PF-SOIL-030) cites that the rationale for the 15% limit of change in soil bulk density is largely based on collective judgment. The Forest Service estimates that a true productivity decline would need to be as great as 15% to detect change using current monitoring methods. Thus, the soil-quality (threshold) standards are set to detect a decline in potential productivity of at least 15%. This does not mean that the FS tolerates productivity declines of up to 15%, but merely that it recognizes problems with detection limits. Also, a 15% increase in bulk density may not be detrimental to productivity; site and soil productivity depend on the soil and ecosystem in which it is found.

The soil disturbance areal extent limit of 15% acknowledges that timber harvest and other land uses cause some unavoidable impacts and impairment. This limit is based largely on what is physically possible, while achieving other resource management objectives. For example, 14 ft wide skid trails spaced 120 feet apart amounts to less than 10% disturbance. Conversely, uncontrolled skidding and machine piling can detrimentally impact 30% or more of the area.

Application of the 15% areal limit has been debated. Bob Mueresse, a retired Region 6 Soil Scientist, states, "Applying the 15% areal limit for detrimental damage is not correct; it was never the intent of the 15% limit and NFMA does not say that we can create up to 15% detrimental conditions. It says basically that we cannot create significant or permanent impairment, period." How that works out in terms of practicality is the problem; it may be more appropriate to look at the overall effect of an impact on an area. For example, displacement of several small patches of ground may not change site productivity, whereas displacement of one or two large areas may cause a substantial loss of site productivity.

Detrimental soil damage is reversible in time if the processes (organic matter, moisture, top soil retention, soil organisms) are in place. Duration of effects is discussed (FEIS pg. 3.5-19). Rehabilitation techniques provide building blocks for soil productivity and speed the recovery process (FEIS pg. 3.5-23 thru 3.5-25). An exception to irreversible soil effects would be Forest Service system roads. System roads are considered permanent infrastructure and not part of the productive land base. However, roads can become part of the productive land base once they have been decommissioned.

FOB/WWI-13: The amount of increase in any degree beyond that is routinely not disclosed, nor is the depth of compaction disclosed. This information is necessary to determine the actual extent of damage and the degree of irreversibility. The information would also be necessary to design adequate mitigation and amelioration implementation.

Assessment of soil compaction from past harvest activities was completed using a shovel probe test. The Draft Northern Region Soil Monitoring Protocol (2008 pg. 25) describes the probe as an effective method to assess compaction in soils. No measurements of bulk density were collected to address actual amounts of increase in bulk density. Bulk density measurement is the only method that closely approximates the percent change in soil compaction over natural levels. Bulk density is a very time intensive and difficult sampling method to assess compaction. Also, bulk density sampling would not be feasible in units with elevated DSD levels because of the high number of samples required to account for site variation. Therefore, compaction is discussed in general terms and can vary from a 15% increase over natural levels to much higher levels. These compacted areas are found where past ground-based activities occurred (historic skid trails and roads). Many of the historic skid trails will be re-used during timber harvest and then subsoiled with the Subsoiling Grapple Rake (SGR) following treatment. The SGR breaks up compaction at depth with little to no mixing of soil horizons.

Depth of compaction is disclosed (FEIS pg. 3.5-10, 3.5-28, 3.5-30, 3.5-35).

FOB/WWI-14: Discovery that an activity area has 15% or more detrimental soil damage should disqualify the area from further ground disturbing activities.

The Region 1 Soil Quality Standards state that "In areas where more than 15% detrimental soil conditions exist from prior activities, the cumulative detrimental effects from project implementation and restoration should not exceed the conditions prior to the planned activity and should move toward a net improvement in soil quality." See FSM 2500 – R-1 Supplement R1 2500-99-1.

FOB/WWI-15: The net effectiveness of mechanical de-compaction soil amelioration techniques needs to be analyzed and disclosed, as well as the degree of above mentioned ancillary impacts to the soil, (mixing mineral soil into top soil, aerating soil organic matter and thereby 'burning' it up more quickly, spreading weeds, fragmenting mychorizae or otherwise disrupting the soil community).

The still experimental soil compaction amelioration techniques proposed are only partially effective and may in fact add to soil damage by way of mixing mineral soil into top soil, aerating soil organic matter (and thereby 'burning' it up more quickly), spreading weeds, fragmenting mychorizae or otherwise disrupting the soil community.

The mechanical de-compaction proposed for restoration is experimental, with little known efficiency coefficients and may not go as deep as some existing compaction, thereby potentially masking compaction in the root zone. The heavy de-compaction machinery itself causes compaction and other types of soil damage.

No depths of existing compaction are disclosed nor are areas and depths of proposed mechanical amelioration disclosed in the DEIS. No accounting of net soil conditions expected after the timber sale include any efficiency factors for the proposed de-compaction devices.

Subsoiling effects on weed spread are discussed in the FEIS (FEIS pg. 3.9-9) and described in more detail below. The Soil Scientist also discusses the effectiveness of decompaction with a SGR (FEIS pg. 3.5-24 thru 3.5-26). Depth of compaction is disclosed (FEIS pg. 3.5-10, 3.5-28, 3.5-30, 3.5-35).

Subsoiling with the SGR was completed in 2008 in the Hayes Creek area on the Bitterroot NF. Recent monitoring compared soil pits in subsoiled areas to soil pits in compacted areas, and found:

the entire soil profile was decompacted in the subsoiled areas
soil moisture was 4% to 40% greater in subsoiled area soil pits
soil horizons were intact and not mixed
Soil infiltration increased in the subsoiled areas.

Mixing surface organics and vegetation could lead to the 'burning up of organics'; however monitoring indicates soils were not detrimentally disturbed. Vegetative growth is more prolific on the subsoil sites due to increased infiltration and moisture in the rehabilitated soils. The increased vegetative biomass on the

subsoil sites will in turn build organic horizons more quickly than the compacted soils – another benefit of decompaction.

Spotted knapweed was abundant in several of the monitoring locations before subsoiling. Monitoring indicates that subsoiled areas do not have more knapweed than the adjacent compacted areas. The grasses were more prolific on the subsoiled areas, which over time may out-compete and reduce the knapweed population. Rhizomatous weeds may spread with subsoiling so areas with rhizomatous noxious weeds should be avoided.

Additional time will be required to note changes in vegetation from subsoiling at the Hayes Creek site since only 1 year of recovery has been monitored. Detrimental surface disturbances from the excavator itself were not noted. The excavator has low ground pressure (5 ½ psi) and even if compaction was created by the machine, the SGR works behind the equipment to decompact soils. More importantly, subsoiling will be done only where compaction already exists, so potential compaction from the excavator is negligible. The complete description of subsoiling monitoring (Monitoring of Subsoiling, Hayes Creek, Bitterroot NF, 2009) is available in the project file (PF-SOIL-011).

A study by Otrosina, Sung, and White (1996) indicated that subsoiled plots had increased fungal biomass when compared to compacted thinning plots and undisturbed control plots. The study was completed in the Sierra Nevada Range in California and included sampling sites on loam/clay loam soils and on granitic soils with coarse sandy loam texture. These soils are similar to those found on the Idaho batholith on the Bitterroot NF. The study noted that subsoiling increased the production of fine root biomass, which contains significantly higher amounts of mycorrhizae than soil alone (Sung et al. 1995).

FOB/WWI-16: As discussed and disclosed in the DEIS, the anticipated increase in DSD due to proposed activities is significantly lower than the best available science indicates. There is available agency science quite specific to the conditions here in the Bitterroot. This underestimation in the LWF DEIS runs counter to the best available agency science of expectable DSD.…This does not agree with the best BNF specific, long-term DSD monitoring reported in 2005 (MEF DEIS) by McBride.

The BNF has recent monitoring data that reflects the impacts from current logging technology (Forest Plan Monitoring and Evaluation Reports 2006, 2007, 2008). Recent monitoring data is the most valid; past monitoring efforts followed different methodologies, which provided misleading results. In many cases, any soil disturbance was considered detrimental during past soil monitoring, which is not an accurate reflection of soil conditions.

In addition, newer harvest systems and silvicultural prescriptions have led to improved soil protection.

FOB/WWI-17: …the LWF DEIS fails to disclose analysis of DSD caused by burning slash piles… This factor must be included in LWF EIS soils analysis.

The effects of burning piles are disclosed in the FEIS (FEIS pg. 3.5-19 thru 3.5-20). Additional DSD analysis of burning large slash piles (greater than 100 ft^2) and not located on landings will be included in the FEIS (FEIS pg. 3.5-20). Most large slash piles are burned on landings and do not lead to additional DSD because the landings are considered permanent infrastructure.

FOB/WWI-18: Unless this condition is met directly under the piles it may be meaningless because the piles intercept precipitation potentially leaving the ground under them drier than ground at that location not under the piles.

The intent of this mitigation is to ensure soil conditions are moist when the piles are burned. You are correct that piles intercept moisture so soils beneath the piles may potentially be drier than the surrounding soils. However, burning the piles when the surrounding soils are moist will protect soils better than when soil conditions are dry. Burning during warm and dry conditions is also highly unlikely because the risk of fire escape would be high.

FOB/WWI-19: As requested in our scoping comments, total acreage of road surface, including temporary, in each activity area should be displayed alongside the detrimental soils condition information.

Detrimental soil information for each unit is in the project file (PF-SOILS-009). The information in this spreadsheet includes the existing DSD, DSD from proposed activities including temporary roads, and expected amount of improvement in soil condition from rehabilitation activities. National Forest system roads are part of the forest infrastructure and are removed from the productive land base. Therefore, system roads do not count towards DSD (R1 SQS) and are not included in the soils analysis.

FOB/WWI-20: Soil conditions, including roads and areas with detrimental soil damage, should be mapped and disclosed on a sub-watershed basis within the project area in order to assess cumulative impacts. This is important in the disclosure of cumulative watershed impacts because detrimental soil compaction would add to impacts from road compaction, ECAs and hydrophobic soils (DEIS, p.3.5-7) in increased and flashier water runoff, which causes higher high flows, lower low flows, and bank instability. (See esp. Lavene Creek section below)

Soil monitoring was conducted on each harvest unit. Detailing exact locations of soil compaction over the entire project area is not necessary to the analysis because the effects of compaction are localized to the area of impact. Soil monitoring has been completed on the proposed activity areas and the data is located in the project file (FEIS pg. 3.5-32 to 3.8-34, PF-SOIL-002 and 010). Cumulative soil impacts from past management in the project areas are discussed in the FEIS (FEIS pg. 3.5-35 thru 3.5-42).

The effects of compacted soils on watershed conditions are evaluated in the watershed analysis. Road densities and ECAs were analyzed on a subwatershed basis (PF-WAT-4). The analysis identified subwatersheds at risk, such as Lavene Creek, because of high road densities or ECAs. The ID Team modified the unit treatment or applied mitigation measures, such as wider buffers, that addressed the level of risk in the subwatershed. See also the response to FOB/WWI-30.

FOB/WWI-21: These ancient debris flow relics tell us that the 2000 fires were not outside the range of historic variability. There have been many such events over thousands of years. These land forms silently disagree with your rationale for logging to save the soil from dreaded "highly severe" forest fire "outside the historic range of variability".

You are correct that debris flows are part of the natural soil disturbance regime. However, fire suppression has altered stand conditions in the project area. Overcrowded stands and high fuel loads increase the potential for high severity fire in the project area, and high severity fires degrade soils (Elliot and Robichaud 2001, FEIS 3.5-7, 3.5-9).

FOB/WWI-22: Unit 1 has existing DSD on 19% of the unit. Even with the proposed mitigation of ground skidding only in winter conditions, an increase in soil compaction is inevitable…. Newer, more stringent requirements may also be unexpectedly ineffective and should not be relied upon in areas already over SQS "limits".

The Interdisciplinary Team modified the treatment of the portion of Unit 1 with high DSD (65 acres below NFSR 363) in Alternative 3. The modified treatment would meet the purpose and need, prevent additional soil disturbance, and provide conditions that would enhance soil rehabilitation. This alternate treatment pertains only to the part of the ground-based yarding portion of the Unit. Proposed activities for the skyline portion of the Unit 1 and the area of ground-based yarding without high DSD would not change in Alternative 3.

In the modified treatment, non-commercial size trees would be cut down using hand tools; the slash would be left on the ground for one year so nutrients could leach into the soils (Palviainen et al. 2004; Baker et al. 1989). A prescribed fire would then be ignited to reduce fine fuel loads. Following the under burn, coarse woody debris levels would be assessed and additional trees (8 inch dbh and greater) would be felled to

meet 15 to 20 tons of coarse woody debris needed for soil rehabilitation and to create adequate spacing to meet silvicultural objectives. Some branches may need to be distributed through this part of the Unit to spread out fuels. If high concentrations of branches increase fire potential, the excess slash would be hand piled and burned. Ground-based equipment would not be needed for this treatment so there would be no additional DSD.

FOB/WWI-23: It is not clear in the DEIS if only the 55 acres of winter ground skidding or all of Unit 1 would receive the slash blanket treatment.

The 55 acres of winter ground skidding was a mistake in the DEIS. Winter ground skidding would occur on the 65 acres below NFSR 363 in Alternative 2. This is the only part of Unit 1 with high DSD and the only part scheduled for winter logging. The remainder of the Unit 1, above NFSR 363, does not have soil disturbances that exceed R1 SQS.

Soil mitigation for Unit 1 is listed in the FEIS on pages 2-18, 2-19 and 3.5-26. Mitigations for the 65 acres below NFSR 363 in Alternative 2 include winter logging and leaving 15 to 20 tons/acre of coarse woody debris on site for soil recovery. The rest of Unit 1 would be harvested under the same guidelines and criteria of the other units and coarse woody debris would average 5 to 10 tons/acre (FEIS pg. 3.5-13).

Treatment of Unit 1 below NFSR 363 in Alternative 3 is described above (FOB/WWI-22). Treatment for the remainder of Unit 1 (above NFSR 363) under Alternative 3 would be the same as for Alternative 2.

FOB/WWI-24: The DEIS does not appear to disclose the additional DSD attributable to the new "temporary" road planned for Unit 1 nor does it appear to disclose the additional 2% DSD expectable from burning slash piles (MEF DEIS, p. 3.5-25)

Because of the many undisclosed factors (unspecified amelioration techniques, lack of amelioration effectiveness coefficients, unaccounted temporary road and slash burning DSD), it is impossible for the Decider or public to intelligently anticipate the soil conditions in Unit 1 upon implementation.

Soil analysis for Unit 1 includes the disturbances from the temporary road (PF-SOILS-009). The temporary road proposed in Unit 1 is outside of the portion of the Unit with high DSD. Higher amounts of coarse woody debris will be retained across the 65 acres in Unit 1 below NFSR 363 (FEIS pg. 2-18, 2-19, 3.5-15 thru 3.5-17). Alternative 2 does not include burning in the 65 acres below NFSR 363 in Unit 1 (FEIS pg. 2-11). Because of that, woody debris will be maintained for soil recovery. Soil amelioration techniques and their effectiveness are specified and discussed in the FEIS (FEIS pg. 3.5-14 – 3.5-17, 3.5-24, 3.5-27).

An alternate treatment for the portion of Unit 1 with high DSD is analyzed under Alternative 3 in the FEIS (see response to FOB/WWI-22)

FOB/WWI-25: …Thus, Unit 1, with 19% existing DSD would receive additional (even more than the DEIS reports) DSD from proposed logging, new roads and slash pile burning followed by only the cursory rehabilitation of leaving slash, which admittedly "does not immediately restore soils to pre-disturbance levels".

This does not satisfy R1SQS requirement that "the cumulative detrimental effects from project implementation and restoration should not exceed the conditions prior to the planned activity".

If the BNF assertion that this proposed activity in unit 1 fits within the R1 SQS is allowed to stand, it clearly shows that the R1 SQS is arbitrary and capricious and is not sufficient to protect soils per the NFMA mandate.

The legitimacy of the R1 SQS needs to be challenged in specific cases. Unit 1 is a good example.

The 15% areal extent of soil disturbance is the limit where impact to soil productivity may be measurable. The temporary roads exist in the unit and new roads would not be constructed. In Alternative 2, no burning is proposed in the portion of the unit with high DSD and it would only be logged in winter over snow,

which would prevent new soil impacts. Leaving high levels of slash on-site restores components of the soil forming processes that will enhance soil development. Granted this is not as instantly gratifying as applying a treatment that would immediately restore conditions to pre-disturbance levels but it accelerates the soil recovery process.

NFMA states that "soil, slope, or other watershed conditions will not be irreversibly damaged"(36CFR sec 1604g(E)(i)), and "…such cuts are carried out in a manner consistent with the protection of soil…and the regeneration of the timber resource." (36CFR sec 1604g (F)(v)). Under Alternative 2, timber in Unit 1 below NFSR 363 would be harvested in winter, high levels of coarse woody debris would be left throughout that portion of the Unit, and fire would not be prescribed to treat the slash. These practices would prevent irreversible damage to the soils in this area, accelerate the soil recovery process, and be consistent with the protection of soils.

The ID Team modified the treatment of Unit 1 below NFSR 363 in Alternative 3 to respond to the concern of high DSD that would increase with timber harvest (FEIS pg. 2-13). The modified treatment in Alternative 3 would achieve the project purpose and need without the use of heavy machinery in the area. The treatment is described in FOB/WWI-22. The environmental effects analysis of the No Action alternative (Alternative 1), and these two action alternatives in the FEIS provides the Deciding Officer and the public a clear basis of choice between the alternatives (40CFR 1502.14).

FOB/WWI-26: … please disclose on maps and discuss all site specific watershed work, road restoration and road use restrictions that were planned under previous NEPA decisions within the proposed project area.…In cases where the planned restoration was required to bring the project area into compliance with Forest Plan standards, the result has been that projects outside legal limits defined by Forest Plan standards have been implemented in anticipation of restoration benefits that never arrived….It will give the public and decision maker tools to help measure the likelihood that various aspects of the project will actually get done within the "Temporal Scope" described as 10 years at DEIS p.1-13

In the Lower West Fork analysis area, most of the work identified in previous environmental analyses has been completed.

The FEIS summarizes watershed work completed over the last 12 years authorized under three environmental assessment decisions: Nez Perce Watershed Restoration and Travel Management (1997), Burned Area Recovery Project (2001), and Frazier Interface (2003) (FEIS pg. 3.6-8).

- Nez Perce Watershed Restoration and Travel Management (1997)
  - 28 roads identified for watershed improvement treatments
    - Watershed work completed on 27 roads
    - NFSR 1347 still needs watershed improvement work
  - Phase I completed in 1998
  - Phase II completed in 1999
- Burned Area Recovery Project (2001): This is the only project where watershed work was needed to offset effects predicted by modeling of the fire, proposed timber harvest, and fuel treatment. No harvest or prescribed fire was analyzed in the Lower West Fork portion of the Burned Area Recovery analysis area.
  - NFSR 13431 listed for storage; completed in 2006
  - NFSR 49: gravel placement on about 2/3 of the road in 2008; remainder expected to be completed in 2009
  - NFSR 49, lower crossing, installed fish passage culvert; completed in 2008 and 2009

  - NFSR 731, East Piquett Road: gravel placed in 2008 on about one mile of road near the stream, beginning with the first wet crossing, including the crossing with East Piquett Creek, and continuing to the switchback.
  - The culvert on NFSR 731, at the East Piquett crossing, was replaced with a fish passage pipe in 2009
  - NFSR 5723 and 5724: Gravelling crossings and BMP upgrades have not been accomplished to date because road improvement funds have focused on roads that parallel streams or produce a lot of sediment such as NFSR 723 (Jennings Camp), NFSR 725 (Meadow Creek), NFSR 321 (North Fork Rye).
- Frazier Interface (2003)
  - 3 miles of BMP road upgrades completed in 2005
    - NFSR 363 and 5729: shaping and gravelling the road surface
    - NFSR 73438: culvert removal and soils revegetated and planted with shrubs.
    - NFSR 5729, Baker Creek crossings, gravel surfacing scheduled for 2009
  - 5 culverts identified for replacement for fish passage – not completed. Engineering surveys and design are complete on half of them but the project needs funding to purchase the culverts.
    - Pierce Creek, NFSR 5629, NFSR 13466; NFSR 363
    - Baker Creek, main channel, NFSR 5629; north channel, NFSR 5629
- BAER funding: NFSR 49 – replaced culvert on unnamed tributary above the gate completed in 2006
- NFSR 5634, road to Baker Lake Trailhead, installed 43 dips to recondition and improve drainage; completed in 2008.

FOB/WWI-27: FOB would like to see that "assumption" of 10 years for project implementation rationalized in the FEIS with the easily available administrative paper work research information we have requested.

The project implementation time frame of 10 years is based on the time it takes to layout, contract, harvest, and close a timber sale. It also provides flexibility to get prescribed fire burning windows and additional funding to implement projects not covered by timber harvest revenues.

As part of the bull trout consultation process for the Lower West Fork project, the U.S. Fish and Wildlife Service directed the Bitterroot NF (Forest) to provide an estimate of the amount of time it would take the Forest to complete all of the culvert replacements and removals proposed in Alternatives 2 and 3. The U.S. Fish and Wildlife Service needs the estimate in order to adequately analyze effects to bull trout. The ID Team developed the 10 year estimate by examining how long it has taken the Forest to complete fish culvert replacements and removals. The Forest has been conducting fish culvert replacements and removals since 2000 and has replaced or removed 50 culverts for fish passage purposes. For those 50 culverts, the average time between completion of NEPA and implementation was 3.3 years. The Forest currently has 25 fish passage culverts on its backlog list that have NEPA completed and are awaiting implementation. For the backlog culverts, the average number of years since NEPA was completed is 4.3 years. The Forest is currently replacing or removing 2-4 fish culverts per year. At that rate, and considering the Forest's performance since 2000, 10 years is a reasonable estimate of the time it will take to replace or remove all of the fish passage culverts in the Lower West Fork project (USDA Forest Service, 2009: Item 21 and 41).

FOB/WWI-28: The LWF FEIS should disclose which restoration activities are needed to bring the project into compliance with applicable standards and laws and which restoration activities are magnanimously meant to improve the situation over and above legally defined limits in the project area. Given that additional certain damage, FOB wants solid, dependable assurance in the FEIS and

Record of Decision that the restoration work described in the LWF project will be done in a timely manner if the commercial logging is done.

The Lower West Fork analysis area complies with applicable environmental standards and laws. Forest Plan goals are to maintain or improve water quality and quantity (Forest Plan pg II-3). Forest Plan objectives are to manage riparian areas to prevent adverse effects on channel stability and fish habitat (Forest Plan II-6). INFISH amended the Forest Plan and the requirements include maintaining stream buffers in riparian habitat conservation areas (FEIS pg. 2-19, 2-20, 3.6-1, 3.7-34). The restoration activities planned in this analysis are to maintain or improve watershed conditions. This project complies with the Forest Plan by designating riparian habitat conservation area buffers wide enough to prevent sediment from reaching the streams (FEIS pg. 2-19, 2-20, 3.6-40, 3.7-15) and proposing road treatments that reduce road related sediment and improve watershed conditions (FEIS pg. 3.6-41). The Montana Streamside Management Zone Act requires buffers between the stream and activity units. The Stream Management Zone (SMZ) defined by this law is narrower than that required by INFISH. Since the Forest complies with the INFISH riparian habitat conservation areas, it is also in compliance with the SMZ Act (FEIS pg. 2-20, 3.6-1, 3.6-41, 3.6-42). The Water Quality Restoration Plan and Total Maximum Daily Loads for the Bitterroot Headwaters Planning Area (Restoration Plan) (DEQ 2005) was developed to comply with the Clean Water Act. The Restoration Plan assigned a road sediment reduction target (FEIS pg. 3.6-1, 3.6-2). The watershed restoration activities proposed in either action alternative would move toward the assigned target by reducing sediment contribution points throughout the analysis area (FEIS pg. 2-26, 2-27, 3.6-21, 3.6-30, and PF-WAT-31, page 3.3-28, 36, 37). In summary, the restoration activities planned in this analysis are to maintain or improve watershed conditions and comply with applicable standards and laws.

The Hydrology Specialist Report (PF-WAT-31 pg. 3.3-28, 3.3-36, and 37) lists a subset of roads as mandatory stewardship items that the ID Team believes would offset potential sediment contributions from activities associated with the project. These stewardship items are mandatory because they will be accomplished as part of the stewardship project; they are not mandatory to bring the analysis area into legal compliance. They were selected because they provide the greatest aquatic resource benefit and could realistically be completed within the duration of the stewardship contract.

The mandatory stewardship items were selected from 2006-2007 field investigations that identified roads and culverts contributing sediment to streams. The roads selected in Alternative 2 are those that contribute the most sediment and therefore the highest priority for treatment (Table 2). The cost of treatment would be about $93,850. The same road treatments in Alternative 2 were selected for Alternative 3 with the addition of NFSR 13424 and the removal of four culverts (Table 3). Road treatment costs under Alternative 3 are about $108,200. These road treatments would be completed under the stewardship contract and prior to contract closure.

The remainder of the restoration opportunities (optional stewardship items) also provide aquatic resource benefits and would be completed as funding is available.

Table 2: Mandatory Stewardship Items to Benefit Aquatic Resources under Alternative 2

Road Number	Watershed	# Culverts Removed	# of Culverts Contributing Sediment	Miles Treated
13411	E. Piquett	4	2	0.8
13411	E. Piquett	1	0	0.4
13457	E. Piquett	0	0	1.8
13466	Pierce	3	2	0.6
13830	Violet	2	2	1.6
13831	Violet	2	2	1.3

Road Number	Watershed	# Culverts Removed	# of Culverts Contributing Sediment	Miles Treated
13836	E. Piquett	2	2	2.4
13434	Piquett	1	1	2.7
13287, 74321	Piquett		Repair Sediment Sources	
Total		15	18.7 tons annual reduction	11.6

Table 3: Mandatory Stewardship Items to Benefit Aquatic Resources under Alternative 3

Road Number	Watershed	# Culverts Removed	# of Culverts Contributing Sediment	Miles Treated
13411	E. Piquett	4	2	0.8
13411	E. Piquett	1	0	0.4
13424	Piquett	4	2	2.9
13457	E. Piquett	0	0	1.8
13466	Pierce	3	2	0.6
13830	Violet	2	2	1.6
13831	Violet	2	2	1.3
13836	E. Piquett	2	2	2.4
13287	Piquett		Repair Sediment Sources	
Total		18	20.4 tons annual reduction	11.8

FOB/WWI-29: Table 3.6-2 on DEIS p.3.6-8 should include a column disclosing the expected increase in sediment delivery to each stream from log hauling.

Such a column has been included in the FEIS (FEIS pg. 3.6-9) but there is no scientific model is available that can quantitatively estimate sediment delivery to streams from log hauling. The amount of sediment delivered to streams during log hauling depends on several site-specific variables, with the most important ones being the condition of the road during the haul (e.g. wet roads versus dry roads), and the distance of the road from streams (FEIS pg. 3.7-15 thru 3.7-17). Generally, dry haul roads produce very little sediment, while wet roads have the potential to deliver large amounts of sediment (FEIS pg. 3.7-15, 3.7-16). With careful sale administration and proper adherence to the hauling mitigation measures (FEIS pg. 2-20), the Forest Hydrologist and Fisheries Biologist expect sediment delivery from log hauling will not be measurable or visible in the stream bottom (FEIS pg. 2-26, 2-27, 3.7-17). Our log haul monitoring supports this prediction (FEIS pg. 3.7-16, 3.7-17).

FOB/WWI-30: Critical information necessary to estimate impacts of project activities on water yield, sediment delivery and their cumulative effect on channel stability is missing from the LWF DEIS. Water yield and sediment delivery are both affected by soil conditions in addition (or multiplication?) to the ECA measurement.

The ID Team disagrees, and believes that satisfactory information needed for the decision maker is presented in both the DEIS and FEIS and summarized below. The DEIS, FEIS, and project file references can be reviewed for more detail.

Equivalent Clearcut Area (ECA) is a simplified version of WRENSS model (USDA, 1974). The Hydrologist used this model to evaluate the effects of past projects on current conditions and flag watersheds where high water yields may be a concern. Watersheds with an ECA over 25% indicate a need for additional analysis and possibly mitigation (FEIS pg. 3.6-5). Subwatershed ECA calculations included harvest and known wildfires since 1973 (FEIS pg. 3.6-9 thru 3.6-16, PF-WAT-4). The differences between existing conditions and the effects of Alternatives 2 and 3 are described in the FEIS (FEIS pg. 3.6-25 thru 3.6-29, 3.6-32, 3.6-33). ECA remains well below the 25% threshold after project implementation in Boulder, Pierce, Troy, and the Lower West Fork (FEIS 3.6-25, 3.6-28). The highest ECA is 13% in these watersheds; a relatively low risk that water yield would increase. The analysis shows East Piquett, Piquett, Violet, and Lavene watersheds would be above the threshold, 35, 54, 70, and 28 percent after implementation, respectively (FEIS 3.6-26, 3.6-28). Field review found Violet Creek had stable streambanks with no evidence of channel downcutting (FEIS pg. 3.6-14, 3.6-28). Channel conditions are good in Lavene Creek (FEIS pg. 3.6-13 and PF-WAT-2). For extra protection, a mitigation measure of wider RCHA boundaries would be required during ignition of prescribed fires to reduce the risk of sediment contributions to the stream (FEIS pg. 2-20, 3.6-28). This additional mitigation measure would maintain the present stream channel condition.

The WEPP model estimated that harvest activities may result in minor amounts of erosion within the units, no measurable sediment contributions to streams would occur due to RHCA buffers, surrounding vegetation mitigation and slope steepness (FEIS pg. 3.6-21,3.6-29, 3.7-14, 3.7-15, PF-WAT-19). Monitoring supports this conclusion (USDA 2003-2006, Item 22; FEIS pg. 3.6-21, 3.7-14). Potential sediment contributions to streams from prescribed fire raised concerns in Pierce and Lavene watersheds. RHCA buffers were widened for the ignition of prescribed fire in Units 32, 33, and 60A to reduce the potential that sediment would enter the streams (FEIS pg. 2-20, 3.6-28). Monitoring conducted on harvest units between 2003 and 2006 found the filtering capacity of the unburned RHCA prevented prescribed fire-created sediment from crossing RHCAs and entering streams (FEIS pg. 3.7-18).

Projects that could contribute to cumulative effects are described in the FEIS (FEIS pg. 3.6-34 thru 3.6-39) and project file (WAT-31 pg. 3.3-39 through 52). The highest potential of cumulative effects comes from roads used during hauling or road decommissioning/storage. All roads that parallel streams have been graveled within the past five years (see the responses to FOB/WWI-26 and FOB/WWI-29, and FEIS pg. 3.6-34, 3.7-15, 3.7-16). Except for culvert removals where sediment contributions are certain, the risk of measureable cumulative effects from the implementation of Lower West Fork alternatives 2 or 3 is low because the potential change in sediment delivery from forest management is low. However, mitigations (FEIS pg. 2-20, 2-26, 2-27, 3.6-18) would reduce the sediment contributions from restoration work and this work would lead to long-term water quality improvement (FEIS pg. 2-26, 2-27, 3.6-21, 3.6-30, 3.7-19).

FOB/WWI-31: Damage maps, and analysis need to be made available to know where potential for cumulative problems with areas of high ECAs, burned/hydrophobic soils, high road densities (open and closed) and otherwise compacted soils.

The ID Team added a map to the FEIS, Fig. 3.5-1 (FEIS pg. 3.5-31), that displays roads and the area of the Rombo fire by subwatersheds, and the calculations of road density are shown in Table 4, below. Figure 3.3-9 in the FEIS displays fire history from 1970 to the present time. The Rombo Fire is the one large fire that may still have hydrophobic soils within the analysis area because it occurred in 2007.

FEIS provides tabular data and associated discussion of the existing ECA in the analysis area subwatersheds (FEIS pg. 3.6-9 thru 3.6-16). Comparison of this information to the watershed map (Figure 3.6-1, FEIS pg. 3.6-3) allows the reader to spatially determine areas with ECA concerns, specifically, Violet and Lavene Creek watersheds. Lavene, Troy, and Pierce Creek subwatersheds have the highest road densities. RHCAs are wider in these subwatersheds to inhibit sediment potentially created by prescribed fire from reaching the streams (FEIS pg. 2-20, 3.6-28). Buffers in Violet Creek were not increased because units proposed for commercial activity were farther from the stream than the buffer distance.

The Detrimental soil disturbance shown in Table 3.5-3 (FEIS pg. 3.5-5) discloses the area and percent of compacted soils. Cumulative effects relative to fire, compacted soils, and timber harvest are discussed in the FEIS (FEIS pgs. 3.5-29 – 3.5-34, 3.5-36, 3.5-37) as are cumulative effects relative to roads and ECA (FEIS pg. 3.6-34 – 3.6-37).

Table 4: Road Density in the Subwatersheds of the Lower West Fork Analysis Area

Subwatershed Name	Total Road Density (miles/sq mile)	Open Road Density (miles/sq mile)	Closed Road Density (miles/sq mile)
Applebury	0.0	0	0
Baker	0.1	0.1	0
Boulder	0.1	0.1	0
Castle	3.8	0	3.8
Christianson	0.2	0.1	<.1
E. Piquett	3.1	0.8	2.3
Lavene	4.0	2.6	1.4
Lloyd	0.3	0.2	0.1
Pierce	4.9	3.1	1.8
Pine	1.1	0.1	1.0
Piquett	2.8	0.7	2.1
Steep	3.5	0	3.5
Troy	5.1	0.1	5.0
Violet	9.2	2.2	7.0
Ward	2.8	1.9	0.9

FOB/WWI-32: According to the best available DSD history on the BNF (see McBride ref above) about 30% DSD on the 98 acres of summer ground skidding can be expected. That would add about 30 acres to the existing 55 acres, bringing the total DSD to about 49%. With the additional 8% DSD expectable from skyline logging (LWF DEIS, p.3.5-17) of 65 acres, over 50% of the unit would suffer DSD. This excessive soil compaction will add to the increased volume and flashier runoff attributable to the, already over threshold, 27% ECA.

Past soil monitoring followed different methodologies that over-estimated detrimental soil disturbance (PF-SOILS-012, PF-SOILS-013) and the data is not valid for estimating potential soil disturbance. Recent monitoring follows the protocols established by (PF-SOILS-014) and the data provides an accurate reflection of soil conditions and potential DSD.

Unit 3 straddles the ridge between Lavene Creek and Lower West Fork subwatersheds, and most of the unit is in the Lower West Fork subwatershed. The 35 acres of Unit 3 in the Lavene Creek subwatershed is all summer ground-based yarding; there is no skyline yarding in the Lavene Creek side of Unit 3. Soil rehabilitation following timber harvest would accelerate the natural processes of soil recovery and create a net improvement in soil productivity (FEIS pg. 3.5-16 , 3.5-17, 3.5-24 thru 3.5-28).

The 20-25% ECA threshold triggers a higher resolution analysis; anything below this threshold has a low probability of causing a detectable increase in water yield (FEIS pg. 3.6-5). Lavene Creek surveys showed channel conditions are good (FEIS pg. 3.6-13). Widening the RHCAs to 300 feet would prevent any

sediment produced by prescribed burning from reaching the stream (FEIS pg. 3.6-28; see also response to FOB/WWI-30).

FOB/WWI-33: How much additional sediment from dust and runoff at crossings is expected from hauling unit 4?... Channel instability in Lavene Creek as well as sediment fro dust and runoff could carry sediment into the West Fork at high water events in Lavene Creek. Additional sediment would violate the TMDL prescription for the West Fork and thereby violate the Clean Water Act..

For the reasons described in our response to FOB/WWI-29, accurately quantifying sediment delivery from log hauling is not possible. Though dust is an inconvenience to people, dust particles are too fine to accumulate on stream bottoms and impair fish habitat quality. Also, most dust particles never reach stream surfaces because they are intercepted by vegetation and eventually wash to the ground during rains. The ID Team expects hauling on NFSR 5630 (the Lavene Creek Road) will not contribute measurable amounts of sediment to Lavene Creek because:

(1) NFSR 5630 has been gravel surfaced and BMP upgraded
(2) the width of the flat, well-vegetated riparian vegetation filter strip averages about 100 feet between NFSR 5630 and Lavene Creek (FEIS pg. 3.7-16).

All of the stream crossings on Lavene Creek have also been gravel surfaced, are not excessively steep, and would be protected with straw bale check dam mitigation (FEIS pg. 2-20, 3.7-16, 3.7-17).

Lavene Creek stream survey found stream channel stability was "good" and conditions were similar to reference streams (FEIS pg. 3.6-13). Although ECA calculations are near the level of concern, there is a wide, low gradient buffer between the road and the stream that would trap sediment before it reaches the stream (FEIS pg. 3.7-16, 3.7-17). In addition, straw bale sediment filters would be installed at points along the road where sediment could enter the stream (FEIS pg. 2-20, 3.7-17). Monitoring has shown this treatment is an effective way of preventing sediment from entering streams. Log hauling on NFSR 5630 with the mitigations in place would not contribute sediment to Lavene Creek and would not violate the Clean Water Act or TMDL recommendations in the Restoration Plan.

FOB/WWI-34: Alternative 2 treats about 3,200 acres of potential and suitable marten and fisher habitat, about 18% of suitable habitat in the project area. (DEIS, p 2-25). This seems like a lot to take away from the fisher, when they are having such a hard time.

Treating potential and suitable marten and fisher habitat does not make it unsuitable habitat. While suitable marten and fisher habitat will be treated in Alternatives 2 and 3, the key characteristics of this habitat will not be changed. Therefore, the proposed actions would not preclude the animals from using the habitat (FEIS pg. 3.8-29—3.8-31). Though the ID Team acknowledge the potential that fisher may use parts of the habitat less, the coarse woody debris, snag, and RHCA standards and mitigations outlined in the Forest Plan and FEIS would ensure that travel, resting, hiding, hunting, and denning habitats would be retained throughout the treatment area.

Neither of the action alternatives would affect fisher population viability because of the large amount of suitable fisher habitat on the Bitterroot NF and adjacent national forests, and the minor impacts the proposed treatments would have on marten and fisher habitat. If an individual happened to occupy an area during treatment, there is a large amount of suitable habitat within the Lower West Fork analysis area and adjacent landscape to which they could be displaced. In conclusion, implementation of either Alternative 2 or 3 may impact individual marten, fishers, or their habitat, however it would not likely contribute to a trend towards the loss of population viability for either species (FEIS pg. 3.8-30), and the potential effects of the proposed alternatives on suitable marten and fisher habitat are minimal in the context of Forest-wide habitat.

Forest monitoring information indicates marten populations are stable and well distributed (PF-WL-012). Less information is known about the populations of fisher on the Bitterroot NF; however trapping records

of fisher in the Bitterroot Valley show the quota has been met for the past ten years. This implies a healthy population present on the Forest.

FOB/WWI-35: Additionally, after thinning the accessibility to snowmobiles will increase, further diminishing fisher habitat effectiveness. This impact needs to be disclosed in the FEIS and mitigation via area closures analyzed.

The FEIS must disclose any impacts to fisher from increased snowmobile use due to improved accessibility after thinning. Mitigation by area closures should be part of the project.

Current cross-country and winter road snowmobile use is restricted to the lower elevations and usage is light-to-moderate (FEIS pg. 3.12-12). Recreational use is predicted to remain light even though forest canopy openings may facilitate access (FEIS pg. 3.12-12). Though crown and tree spacing would be wider in the treatment areas, the remaining stands would be fully stocked and not invite cross-country snowmobile use. Area closures are not necessary as mitigation measures since a relatively small portion of the habitat would be affected. Riparian corridors and old growth stands would retain habitat components that provide resting, foraging, and dispersal opportunities; snags and coarse woody debris will be retained in treatment units (FEIS pg. 3.8-26 –3.8-28). Fisher prefer forests with continuous cover and use forested riparian areas with late successional stage vegetation extensively for foraging, resting, and as travel corridors (Claar et al 1999).

Scientific literature focusing on the effects recreational activities have on fishers is limited. Direct human activity, in general, has been documented to have little effect on fisher movements (Heinemeyer & Jones 1994). However, management activity may indirectly lead to negative impacts on populations (Claar et al 1999). Snowmobile trails may be used by trappers and can thus increase the vulnerability of fisher to trapping mortality and overharvesting. Fisher are a low-density species with large home range sizes and low fecundity rates, which makes the species vulnerable to local extinctions through overharvesting. However, if management planning is done on a landscape scale while incorporating the concept of refugia, as is done with this project, negative effects on fisher due to recreational activities are minimized. The Selway-Bitterroot Wilderness and Inventoried Roadless Area, Allan Mountain Roadless Area, riparian areas, and old growth stands provide refuge for fisher adjacent to the treatment units. Snowmobile activity may affect individuals on a site-specific basis, but would have a low impact on populations.

FOB/WWI-36: The 2005 map made changes to road designations without proper environmental analysis, and therefore illustrates many roads as open to vehicles up to 50" in width where those vehicles were in fact prohibited by previous NEPA decisions.

It is apparent that the BNF did not comply with NEPA requirements when it updated its Visitor and Travel Map in 2005, as it changed the protections established in prior decision documents that ensured compliance with NEPA, NFMA, and other environmental mandates.

These changes were done by fiat with no NEPA analysis or public process and no science to show any differences in impacts between full-sized vehicles and smaller motorized vehicles. regarding the resources in question. Where is the science?

The 2005 Visitor Map and its compliance with NEPA and NFMA are not analyzed in this project. The Lower West Fork ID Team made recommendations for travel management in the analysis area based on resource needs and conditions.

FOB/WWI-37: In your discussion of Travel Management Direction you should identify the authority and make available in the LWF FEIS documentation of the decision to open code "90", R-4, R-6 or R-7 roads to ORVs.

The authority to manage a transportation system resides in 36 CFR 212 subparts A, B, and C. A point of clarification about ORVs: the Bitterroot NF manages the above route classes for ATVs. ATVs are defined as, "All terrain vehicle/quadracycle – any motorized off highway vehicle 50 inches or less in width, having

a dry weight of 600 pounds or less that travels on three or more low-pressure tires with a seat designed to be straddled by the operator. Low-pressure tires are 6 inches or more in width and designed for use on wheel rim diameters of 12 inches or less, utilizing an operating pressure of 10 lbs per square inch (psi) or less as recommended by the vehicle manufacturer." (2005 Forest Visitor Map). These routes are also open to motorcycle use.

FOB/WWI-38: The BNF appears to have opened up a large amount of ML 1 roads to ORV use without NEPA and without changing the maintenance level designations.

This situation must be disclosed and discussed within the LWF FEIS. How many miles of R-4, R-6, R-7, code 90 roads fall within the LWF project area? What were the purposes of original NEPA closures? What are the names of the original NEPA documents that authorized the original yearlong closures?

In the Lower West Fork project area there are approximately 200 miles of road

- R-4: 61.5 miles
- R-6: 30.9 miles
- R-7: 2.1 miles
- Code 90: 1.2 miles

NEPA documents that address travel management in the project area are:

- 1987 Bitterroot National Forest Plan, Appendix K
  - No travel management specific to Lower West Fork Project Area
- Burned Area Recovery EIS – signed 2001
  - Travel Management not changed in Lower West Fork Project Area
- Piquett Violet Area EA – signed April 1987
  - Purpose: roads closed for elk habitat effectiveness
  - EHE in Piquett 3rd order drainage is 44%
  - EHE in East Piquett 3rd order drainage is 43%
  - EHE in Violet 3rd order drainage is 49%
  - No roads specifically mentioned.
- Buck Little Boulder EIS – signed August 1993
  7.7 miles of road overlap in Lower West Fork project area
  - Purpose: watershed restoration
  - Decision: Close to all motorized vehicle use
  - Practice: restricted seasonally 10/15 – 6/15 to vehicles < 50 inches wide (ATVs can use roads between 6/15 and 10/15).
- Castle Creek II EA – signed June 1990[1]
  8.3 miles of road overlap in Lower West Fork project area
  - Purpose: fisheries and water quality
  - Decision: Close 4 roads, NFSR 74338, 74339, 74605, 74606
  - Practice: 5 roads closed yearlong to motorized vehicle use; 4 roads closed yearlong to full-size vehicles and restricted seasonally 10/15 – 12/1 to vehicles < 50 inches wide (ATVs cannot use roads between 10/15-12/1).

[1]In the EA Supplement 2, page 4, paragraph 5 states the following: "A Forest Service interdisciplinary (ID) team, which includes the Forest hydrologist,

inspected existing roads, road stream crossings, and skid trails to determine the need for sediment mitigation (Agreement, p. 1). The needed measures include:

1. two road closures with revegetation in 1990,
2. two road closures with revegetation in 1993,
3. gravel road surfacing at three road stream crossings,
4. stream bank riprap at toe of road fill with straw bale at cross drain outlet,
5. mulch and netting application on fill slope of main existing stream crossing,
6. existing skid trail revegetation,
7. addition of drive-through dips and culverts to existing roads,
8. planting existing skid trails and closed roads with trees.

These measures are documented on a map in the project file."

- Nez Perce Watershed Restoration and Travel Management DM – signed October 1997
  21.8 miles of road overlap in Lower West Fork project area
  - Purpose: Not stated
  - 21.0 miles of road managed consistent with the decision
  - 0.2 miles managed more restrictively:
    - Decision: on 74347 operate at R-3 restricted 10/15 to 6/15 to all motorized use
    - Practice: operates as R-7 closed yearlong to full size vehicles, restricted 10/15 to 6/15 to vehicles < 50 inches wide
  - 0.6 miles managed less restrictively:
  - Decision: on 13466 operate at R-3 restricted 10/15 to 6/15 to all motorized use
  - Practice: operates as R-2 restricted 10/15 to 12/1 to all motorized vehicles

FOB/WWI-39: Specifically we ask that you disclose if these roads have factored into the LWF EIS resource impact analyses just as they would if they were open seasonally to full size vehicles. If not, why not.

How does the opening of these roads impact the watershed problems that caused their former closure after NEPA analysis and authorization? How does their opening affect wildlife security regarding hunting, calving and winter forage?

All roads, open or closed, were considered in the watershed analysis. Inventories conducted on all roads in the analysis area occurred in 2005 and 2006 (PF-WAT-27). All crossings were reviewed and identified as either contributing or not contributing (FEIS pg. 3.6-8, PF-WAT-16). The roads are considered as impacts on the landscape and treated the same as an open road as long as they are on the system. A stored road that is re-opened is analyzed as a temporary road and appropriate mitigation and restoration are applied (PF-WAT-23).

EHE analysis was reviewed between the DEIS and the FEIS. The analysis was based on open roads. Open roads are defined as roads open to full-sized vehicles during all or part of the year (FEIS 3.8-15 –3.8-17, 3.8-23 –3.8-26). Route density was also calculated in the analysis area though there is not a Forest Plan standard that addresses this use relative to wildlife (FEIS 3.8-15, 3.8-16). Routes are typically roads that are closed to full-size vehicles but open year-long or seasonally to other motorized use. In the Lower West Fork analysis, the ID Team proposed closing roads by storage or decommissioning but did not propose opening closed roads for public travel. Some closed or non-system roads may be re-opened to access timber harvest units but they will be stored or decommissioned following use. Any roads that may be opened for timber harvest access are well outside of the security areas (FEIS 3.8-16, 3.8-19, 3.8-24).

FOB/WWI-40: Allowing ORVs to go around locked gates directly causes damage by forcing vehicles off the road prism. It also trains-in and sends a clear message that reinforces the already prevalent notion that it's OK to drive off road and around locked gates.

Allowing OHVs to drive around the gates may not be the best method of providing access but options are limited when full sized vehicle access is needed at some times of the year or in the near future. Allowing OHV access on some roads closed to full sized vehicles is a common practice on the Bitterroot NF. Road signs posted at the road closure gate indicate accepted travel method and season of use for roads. While some travel restrictions may be violated by irresponsible users, monitoring all gates for appropriate use at all times is difficult. The Bitterroot NF employ a full time OHV ranger who monitors OHV use and gate effectiveness on the Forest, and maintains or replaces gate signs when needed. The Lower West Fork analysis does not recommend opening roads or allowing OHV use on roads currently closed to that use. When OHVs travel on roads not designated for that use, law enforcement is notified and they investigate the matter.

FOB/WWI-41: Any categorical distinction between roadless land and unroaded land is divorced from the land itself. It is simply administrative, certainly not ecosystem oriented. Our concern is for the biological value of the land and water.

With your language and approach, you cloud important ecological considerations about the land by sowing doubt with allusions to the credibility of the messenger. Whatever acres of land are unroaded (no quotes) on the ground have the same potential values as any other roadless land.

The distinction between Inventoried Roadless Areas and unroaded areas exists because Inventoried Roadless Areas must be managed under administrative protections. The criteria for inclusion in Roadless Areas are discussed in the FEIS (FEIS pgs. 3.12-4, 3.12-7). The Bitterroot NF recognizes that unroaded lands have values similar to those in Inventoried Roadless Areas (FEIS pg. 3.12-4, 3.12-10). The Forest Wilderness Coordinator analyzed the unroaded areas in the Lower West Fork analysis area in the context of the resource values listed in Table 3.12-1 (FEIS pg. 3.12-4) and the potentially unroaded areas are displayed in Figure 3.12-1 (FEIS pg. 3.12-5). The effects on the five roadless area attributes of the unroaded areas are on page 3.12-14 through 3.12-18 of the FEIS.

The use of quotes on the word 'unroaded' was not meant to sow doubt about anyone's credibility but to display the ID Team's uncertainty that no roads exist in the unroaded areas. During field reconnaissance, the ID Team found several unmapped, constructed roadbeds that will be useful to current management and may be useful in the future. Many people assume that if an area is described as unroaded, it is pristine and has never been managed. This is not the case as displayed in Figure 3.12-2 (FEIS pg. 3.12-15).

FOB/WWI-42: Where is the 1.4 miles of "temporary" road that would be built in unroaded land, according to Table 3.12-3? It does not seem to be on the map. This information should be disclosed on a map in the FEIS.

FOB strongly opposes road building in both unroaded and roadless areas

The temporary roads that extend into the unroaded lands are shown on the alternative maps and Figure 3.12-1 (FEIS pg. 3.12-5).

FOB/WWI-43: Allan Mountain IRA is part of a critical hub of linkages connecting the Salmon Selway ecosystem with the Sapphire Crest route to the Northern Continental Divide ecosystem as well as the route south along the Divide to the Yellowstone ecosystem. Failure to disclose impacts on biological corridor values in the DEIS is a serious flaw.

The Lower West Fork analysis area includes 9,494 acres of the 104,069 acres Allan Mountain IRA that is on the Bitterroot National Forest. No treatments are proposed in this roadless area. There would be no direct effects on wildlife in the Allan Mountain IRA from this project (FEIS 2-33, 2-35, 2-36, 2-37). The areas closest to the Roadless Area would remain unchanged in the long term. Major linkages between

refugia and various ecosystems are not interrupted in the current landscape patterns any more than they were by the fire in the past. The Selway-Bitterroot Wilderness, Selway-Bitterroot roadless area, and the Allan Mountain roadless area provide large refuge areas for fisher. The riparian linkages will remain intact because no timber harvest will occur in them. The units around the riparian areas will also retain habitat components important to fisher though crown closure would be less than 100 percent (FEIS 3.8-29 –3.8-31.

Additionally, the Forest Plan presents no regulatory directions addressing animal movement, migration, and dispersal with which the Forest Service must comply (FEIS pg. 3.8-66).

FOB/WWI-44: We believe that road prisms make the most identifiable and manageable boundaries for roadless and unroaded areas. Areas without roads are then truly identified as roadless areas.

Though road systems are definitely identifiable features, they are not the only features that can be used to identify boundaries. Roads adjacent to unroaded areas detract from the integrity, naturalness, and solitude values of the areas because of the noise and dust from vehicle use and the potential for vehicle trespass into roadless areas. Slope breaks and other topographic features that block the sights and sounds of roads and other types of human activity make good identifiable and manageable boundaries and protect the values of the unroaded environment.

FOB/WWI-45: According to p. 3.12-9, stumps within areas without roads reduce the Apparent Naturalness of an area, thereby diminishing Wilderness Characteristics. This policy is misdirected, but given its use, we therefore oppose thinning in areas without roads identified on the FOB roadless/unroaded map.

What is stated on page 3.12-10 in the FEIS (DEIS 3.12-9) under the heading of Apparent Naturalness is, "Apparent Naturalness depends on scale. If a visitor were to focus on the immediate vicinity while in the unroaded land, it would seem somewhat natural as described in the preceding paragraph (Natural Integrity). Looking at the area from a landscape perspective, the presence of existing roads, past timber harvest, and the heavy use of some trails by motorcycles and/or OHVs would decrease this perception of apparent naturalness." There is a high level of forest management that has occurred in and adjacent to the unroaded blocks adjacent to the IRAs. While the areas still retain a natural appearance they do not singly or collectively add to the characteristics valued in IRAs. The steep topography of the unroaded blocks and adjacent roads inhibits a sense of solitude and remoteness because the roads are within view and the sounds of motorized vehicles carry through the area. Adding these areas to the IRAs would not buffer the IRAs from the managed areas or add to wilderness characteristics of the IRAs.

The following table discloses the area of thinning proposed under Alternatives 2 and 3 in the unroaded areas

Table 5: Area of thinning Proposed in Unroaded Areas in the Lower West Fork Analysis Area under Alternative 2 and Alternative 3

	Alternative 2 (acres)	**Alternative 3 (acres)**
Commercial Thin	308	292
Non-Commercial Thin	13	5

USEPA-1: Based on the procedures EPA uses to evaluate the adequacy of the information and the potential environmental impacts of the proposed action and alternatives in an EIS, the DEIS has been rated as Category EC-2 (Environmental Concerns -Insufficient Information) due to potential for at least short-term sediment effects from proposed management activities.

Noted - See responses to comments below and additional analysis in the FEIS when necessary.

USEPA-2: We appreciate the inclusion of clear narrative discussions describing alternatives, as well as the tables presenting important information and features of the alternatives, and tables comparing alternatives, and color foldout alternatives maps in Chapters 2 (Tables 2-2 to 2-8). We also appreciate inclusion of the information on BMPs and Cumulative Effects included in the Appendices. The narrative, tables, maps, figures and appendices facilitate improved project understanding, help define issues, and assist in evaluation of alternatives providing a clearer basis of choice among options for the decisionmaker and the public in accordance with the goals of NEPA.

Thank you.

USEPA-3:: The EPA supports conduct of improve forest vegetation management activities to reduce fire risks and resilience to fire, and insects and disease. We encourage planning and conduct of vegetation management activities in a manner that minimizes adverse environmental effects, and addresses watershed restoration, particularly for a project in the watershed of a water quality impaired stream included on Montana's Clean Water Act Section 303(d) list (West Fork Bitterroot River)….

We are pleased that each of the action alternatives includes activities to improve watershed conditions (i.e., road storage and decommissioning, removing culverts that increase sediment production and/or serve as fish barriers, and restoring soil in areas impacted by prior terracing disturbances).

Noted

USEPA-4: There appear, therefore, to be environmental and resource management trade-offs associated with selecting between Alternatives 2 and 3. However, we support Alternative 3 over Alternative 2 due to the improved potential for watershed and water quality improvement and reduced impacts to fish habitat likely to occur with Alternative 3. We consider such benefits of Alternative 3 to be important because the West Fork Bitterroot River is a water quality impaired stream, and the project area is within the Bitterroot Headwaters Total Maximum Daily Load (TMDL) Planning Area.

Noted

USEPA-5: We generally favor understory thinning from below, slashing and prescribed fire to address fuels build-up with reduced ecological impacts. We also favor retention of the larger more vigorous trees, particularly trees of desirable tree species whose overall composition is in decline. We particularly support conduct of activities to restore Ponderosa pine and western larch. The larger healthier trees are generally long-lived and fire resistant, and provide important wildlife habitat…. If the forest canopy is opened too much by removal of large fire resistant trees it may promote more vigorous growth of underbrush and small diameter trees that would increase fuels and fire risk in subsequent years, contrary to the fire risk reduction purpose and need….

The Lower West Fork project appears to be generally consistent with these measures, particularly the need to restore fire as a natural disturbance process and to retain and promote Ponderosa pine.

Noted

USEPA-6: It would be helpful if the extent of proposed harvest of large trees of desired species in Lower West Fork harvests were more clearly identified in the FEIS.

The location for proposed harvest of trees in excess of 6.5 inches dbh is identified as "Commercial Thin (acres)" in Table 2-2: Unit Treatments Under Alternative 2 (FEIS pg. 2-6, 2-7). Unit numbers and acres are displayed in the table. The information is also displayed in maps Figure 2-1: Vegetation Treatments in Alternative 2 and Figure 2-2: Vegetation Treatments in Alternative 3 (FEIS pg. 2-30, 2-33).

The desired stand conditions by VRU are described in the FEIS (FEIS pg. 3.2-17 thru 3.2-20). The effects of commercial thinning are described in the FEIS (FEIS pg. 3.2-28 thru 3.2-32). The purpose of the commercial thins is to retain large, ponderosa pine and, to a lesser extent, Douglas fir in the stands. While some large trees would be harvested to achieve the desired spacing, the Forest Service does not know how many. The map titled Figure 3.2-2: Forest Size Classes in the Lower West Fork Analysis Area depicts treatment units and tree sizes classes in the analysis area (FEIS pg. 3.2-13). In the DEIS, this map was titled Figure 3.2-2: Cover Types in the Lower West Fork Analysis Area. Similarly Figure 3.2-1: Vegetation Response Units (VRU) in the Lower West Fork Analysis Area provides information about the biological capabilities and disturbance processes in each treatment unit (FEIS pg. 3.2-7). The associated species mix for each VRU is described in the FEIS on pages 3.2-5 through 3.2-10.

USEPA-7: The Bitterroot National Forest should coordinate their proposed activities in the West Fork Bitterroot River watershed with Montana DEQ TMDL program staff to assure consistency of proposed activities with the State's Bitterroot Headwaters TMDL (contact Mr. Robert Ray at 406-444-5319).

DEQ was contacted to notify them that the DEIS was in the planning stages and a copy was sent to the agency. DEQ often relies on EPA to review Forest Service EISs and notify DEQ if they need to get involved (pers. comm. Robert Ray June 26, 2009). DEQ also stated, "Based upon EPA's review, without taking the time to look at the EIS, my response is to support EPA's recommendation for Alternative 3, as likely to be consistent with the TMDL."

USEPA-8: our general recommendations regarding roads for your information.

- → **minimize road construction and reduce road density as much as possible to reduce potential adverse effects to watersheds;**
- → **locate roads away from streams and riparian areas as much as possible;**
- → **locate roads away from steep slopes or erosive soils;**
- → **minimize the number of road stream crossings;**
- → **stabilize cut and fill slopes;**
- → **provide for adequate road drainage and control of surface erosion with measures such as adequate numbers of waterbars, maintaining crowns on roads, adequate numbers of rolling dips and ditch relief culverts to promote drainage off roads avoid drainage or along roads and avoid interception and routing sediment to streams;**
- → **consider road effects on stream structure and seasonal and spawning habitats;**
- → **allow for adequate large woody debris recruitment to streams and riparian buffers near streams;**
- → **properly size culverts to handle flood events, pass bedload and woody debris, and reduce potential for washout;**
- → **replace undersized culverts and adjust culverts which are not properly aligned or which present fish passage problems and/or serve as barriers to fish migration;**
- → **use bridges or open bottom culverts that simulate stream grade and substrate and that provide adequate capacity for flood flows, bedload and woody debris where needed to minimize adverse fisheries effects of road stream crossings.**

We also encourage conduct of inspections and evaluations to identify conditions on roads… that may cause or contribute to sediment delivery and stream impairment, and to include activities in the project to correct as many of these conditions and sources as possible.

A total of 2.2 miles of temporary road is the only road construction planned. Road segments range in length from 0.1 to 0.4 mile. Road construction is limited to temporary roads and has been minimized (FEIS pg. 3.6-22 and 3.6-30). Please refer to the mitigation table (FEIS pg. 2-19 thru 2-21).

USEPA-9:: …management direction assures that road maintenance (e.g., blading) be focused on reducing road surface erosion and sediment delivery from roads to area streams. Practices of expediently sidecasting graded material over the shoulder and widening shoulders and snow plowing can have adverse effects upon streams, wetlands, and riparian areas that are adjacent to roads. Road use during spring breakup conditions should also be avoided. Snow plowing of roads later in winter for log haul should also be avoided to limit runoff created road ruts during late winter thaws that increase road erosion

All road maintenance activities, including blading and snow plowing, are required to comply with the U.S. Fish and Wildlife Service's Programmatic Biological Assessment for Road Maintenance (FEIS pg. 2-20). Complying with the Programmatic Biological Assessment would ensure that the concerns expressed in this comment are adequately met. The Forest has been closely monitoring its winter log hauls (FEIS pg. 3.7-16, 3.7-17) and is documented in the project file (PF-FISH-4, PF-FISH -5, and PF-FISH -6).

USEPA-10: If there are road maintenance needs on unpaved roads adjacent to streams and wetlands we encourage utilization of such training (contact Donna Sheehy, FS Rl Transportation Management Engineer, at 406-329-3312).

We also note that there are training videos available from the Forest Service San Dimas Technology and Development Center for use by the Forest Service and its contractors (e.g., "Forest Roads and the Environment"-an overview of how maintenance can affect watershed condition and fish habitat;…

Noted

USEPA-11: Wetland impacts should be avoided, and then minimized, to the maximum extent practicable, and then unavoidable impacts should be compensated for through wetland restoration, creation, or enhancement

All wetlands would be designated, marked, and protected as RHCAs (FEIS pg. 2-19, 2-20), and as such, would be protected from timber harvest and potentially negative effects from prescribed burning (FEIS pg. 2-19, 2-20). With these mitigations, wetlands are unlikely to be negatively affected by the Lower West Fork project (FEIS pg. 3.6-42, 3.6-43).

USEPA-12: It is important that proposed activities be consistent with the riparian management objectives described in the ICB Strategy… We are pleased that all timber management activities would be conducted to comply with INFISH standards and guidelines avoiding harvest in Riparian Habitat Conservation Areas (RHCAs) buffers; no timber harvest and no equipment operation would occur in wetlands and appropriate use of BMPs to all harvest and vegetation management activities (page 3.6-36, 3.6-42).

The Lower West Fork project is consistent with the riparian goals and riparian management objectives in the INFISH strategy (USDA Forest Service, 1995b; FEIS pg. 3.7-34). As such, the project is also believed to be consistent with the riparian management objectives in the ICB strategy.

USEPA-13: It is important that wetlands are included as RHCAs, and that timber harvest, road construction, or operation of heavy equipment not be allowed in wetland areas, We recommend that harvest units be reviewed in the field to determine the presence of wetlands and identify wetlands on the Sale Area Map and be flagged on the ground so that timber contractors will be able to avoid them.

All wetlands would be designated, marked, and protected as RHCAs (FEIS pg. 2-19, 2-20), and as such, would be protected from timber harvest (FEIS pg. 2-19), temporary road construction (FEIS pg. 3.7-17), and entry of ground-based equipment (FEIS pg. 2-20). During harvest unit layout, timber preparation personnel will mark all wetlands and appropriate buffers as RHCAs and designate them on the Sale Area Map (FEIS pg. 2-20).

Monitoring indicates that marking RHCA boundaries occurs regularly and with few exceptions, they are effective in preventing the harvest of trees or use of heavy equipment in the wetlands (Forest Plan Monitoring and Evaluation Report, Fiscal Years 2006, and 2007).

USEPA-14: Are any other ground harvest units to be harvested during winter on snow or frozen ground to reduce adverse. effects to soils and erosion? Would it be appropriate to use skyline or winter harvesting for harvest units on any other such landtypes?

Only Alternative 2 has ground-based winter harvest proposed in Unit 1 below NFSR 363 (65 acres). All other ground-based harvest would occur as scheduling permits, in either winter or summer. Unit 1 is an exception since high rock content eliminates the possibility of subsoiling to rehabilitate soil compaction. Other mitigations and rehabilitation are prescribed to Unit 1 to protect soils (FEIS pg. 3.5-14 thru 3.5-15, 3.5-25). Winter conditions that meet ground-based harvest requirements seldom occur in the project area because the ground-based units are at the lower elevations. Unit 1 may not be treated for a number of years if winter conditions are not achieved. The ID Team wants to avoid this situation across the project area.

Slope limitations for tractor operations (BMP IV.A.1, 2, 4, 5, IV.B.1) are restricted to slopes less than 35 percent or 20% adverse. Portions of harvest units on 35 percent slopes or less are designated as tractor ground, slopes greater than 35 percent are skyline (FEIS pg. 3.5-17).

USEPA-15: …we still want to encourage the Bitterroot NF to review proposed measures to protect soils and reduce erosion to assure that all of the units with particularly sensitive soils or on landtypes with greater vulnerability or risk of detrimental soil disturbance such as erosion, compaction, and mass wasting include adequate mitigation measures and/or less damaging harvest methods to avoid erosion and other detrimental soil impacts and/or higher levels of sediment production and transport.

Sensitive soils are displayed in Table 3.5-1, 3.5-2, and 3.5-3 (FEIS pg. 3.5-4, 3.5-5). Measures to protect soils and reduce erosion are displayed in Table 2-6 (FEIS pg. 2-15, 2-16) and discussed in the FEIS on pages 3.5-11 and 3.5-12. Mitigation measures are summarized in the FEIS on pages 2-18, 2-19, 3.5-26 thru 3.5-28.

USEPA-16: We often suggest measures such as use of existing skid trails wherever possible; restrictions on skidding with tracked machinery in sensitive areas; using slash mats to protect soils; constructing water bars; creating brush sediment traps; adding slash to skid trail surfaces after recontouring and ripping; seeding/planting of forbs, grasses or shrubs to reduce soil erosion and hasten recovery; as well as recontouring, slashing and seeding of temporary roads and log landing areas following use to reduce erosion and adverse impacts to soils.

All activities will follow SWCPs and BMPs (FEIS Appendix A). Mitigations will be applied to provide additional protection where needed (FEIS pg. 2-18 thru 2-20, 3.5-26 thru 3.5-28).

USEPA-17: …we appreciate the identification and the extent to which timber harvest, temporary road construction, timber discussion of harvest and prescribed burning would take place on sensitive soils in the Lower West Fork Project, and the consideration that has been given to mitigation of soils impacts.

Noted

USEPA-18: We are pleased that coarse woody debris would be retained (from 5 to 24 tons per acre depending on fire group) on harvest sites to help maintain soil productivity (Table 3.5-5, page 3.5-13). It is important that adequate woody debris is retained on site to maintain soil productivity. We are also pleased that previously disturbed terraces would be restored in both action alternatives.

Noted

USEPA-19: It is important that field soil monitoring and analysis take place to verify that the Region 1 soil quality thresholds are not exceeded, particularly on the sensitive landtypes. Will field soil monitoring allow quantification of benefits to soils that may be restored on the previously disturbed terrace areas?

Field monitoring provided the information needed to quantify detrimental soil disturbance (DSD) (FEIS pg. 3.5-1, 3.5-5, 3.5-6, PF-SOILS-009). Post treatment monitoring will be done on a portion of the terrace units and subsoiled areas as part of annual forest plan monitoring to assess treatment affects.

USEPA-20: We believe monitoring should be an integral part of land management

The Bitterroot NF annually monitors land management activities and publishes the results in the Forest Plan Monitoring and Evaluation Report. The latest report is on the Bitterroot NF web site and listed under Projects and Plans (http://www.fs.fed.us/r1/bitterroot/projects/). Monitoring associated with the Lower West Fork project is described in the FEIS on pages 2-24 and 2-25.

USEPA-21: The EPA particularly believes that water quality/aquatics monitoring is a necessary and crucial element in identifying and understanding the consequences of one's actions, and for determining effectiveness in BMPs in protecting water quality… BMPs… need to be monitored to verify their effectiveness… We encourage adequate monitoring budgets for conduct of aquatic monitoring to document BMP effectiveness and long-term water quality improvements associated with road BMP work and road decommissioning.

We generally recommend that more aquatic monitoring be included in projects, using aquatic monitoring parameters such as channel cross-sections, bank stability, width/depth ratios, riffle stability index, pools, large woody debris, fine sediment, pebble counts, macroinvertebrates, etc,. Biological monitoring can be particularly helpful, since monitoring of the aquatic biological community integrates the effects of pollutant stressors over time and, thus, provides a more holistic measure of impacts than grab samples.

…recognizing that there are limited resources for monitoring, we can accept a lesser level of aquatic monitoring for this project. We note that there may be PACFISH/INFISH Biological Opinion (PIBO) monitoring sites in the project area that could also be used to help evaluate actual project effects (http://www.fs.fed.us/biology/fishecology/emp/index.html). If there are PIBO monitoring sites in the area they should also be considered for their potential to evaluate project effects.

Monitoring of fisheries resources in the Lower West Fork project area is described on pages 2-24 and 2-25 of the FEIS. Biological monitoring of fish populations (before and after treatments) would occur in the four streams (Pierce, Lavene, Piquett, and East Piquett creeks) where effects to fish populations could most likely occur (for detailed historical information on these sites, see PF-FISH-1). Fish habitat monitoring would consist of monitoring water temperatures in those same four streams before and after timber harvest (FEIS pg. 2-24). One PIBO monitoring site is present in Piquett Creek near our fish population monitoring site; a second PIBO monitoring site was established in East Piquett Creek near the Forest boundary in 2008. The long-term data from the PIBO sites will augment the pre- and post-harvest monitoring data to evaluate project effects.

The Watershed Monitoring Plan is in the project file (PF-WAT-7). The Hydrologist and Fisheries Biologist often monitor some of the aquatic monitoring parameters listed above to describe existing conditions (PF-WAT-2) and monitor post-treatment when funding is available. In recent years, the Bitterroot NF has focused implementation monitoring on effectiveness of treatments to answer questions such as:

1) How effective have revegetation efforts been on roads stored and decommissioned?
2) Are the closures effective in restricting motorized vehicles?
3) Did RHCA boundaries effectively filter sediment?
4) Were the mitigation measures implemented and effective?

USEPA-22: The DEIS includes a good analysis and discussion of project air quality conditions and effects from proposed burning activities (pages 3.3-1 to 3.4-13): We particularly appreciate the identification of mitigation measures to reduce air quality impacts (page 3.4-5), and the Tables and Figures showing estimated PM 2.5 emissions and downwind levels, which improve understanding of potential air quality impacts.

Thank you.

USEPA-23:: It may be of interest to the public to display the website for the Montana/Idaho State Airshed Group, http://www.smokemu.org... This is Federal policy which reconciles the competing needs to conduct prescribed fires to manage vegetation and restore fire to fire adapted ecosystems while at the same time maintaining clean air to protect public health. A copy of the Interim Air Quality Policy can be found at: http://www.epa.gov/ttn/oarpgltI/memoranda/fireful.pdf. EPA air quality guidance can be found at http://www.epa.gov/air/caa/ .

The FEIS states, "...though prescribed fires are scheduled to occur during favorable weather forecasts, unpredicted weather changes can keep smoke from dispersing as intended" (FEIS pg. 3.4-8). Pre-season notification letters with maps are mailed to the district mailing list. Individuals wishing to be notified about a burn typically contact the ranger district. Interagency Prescribed Fire Burn Plans, Element #11 also require that notifications be made prior to implementation.

USEPA-24: It is not clear to us why no use of herbicides is considered in Alternative 3 to control weeds that may develop in areas of harvest and road work. We suggest that this be clarified in the FEIS.

The Alternatives present a range of activities from which the decision maker can review and select. The range of activities chosen in the Record of Decision may contain a mix of activities presented and analyzed in the FEIS (40 CFR 1505.1(e)). Alternative 2 displays the potential effects of timber harvest and prescribed fire treatments on noxious weeds and the potential need to treat them using herbicides. Alternative 3 displays the effects of timber harvest and prescribed fire on noxious weeds without the option of treating them with herbicides. This provides a basis for the Deciding Officer to choose whether to include the use of herbicides in his decision (40 CFR 1502.14). Though noxious weeds are not treated under Alternative 1, other than in areas already covered by other NEPA decision, there are no vegetation treatments so it does not display the effects associated with vegetation treatments. The Deciding Officer may choose to retain the option of using herbicides to treat noxious weed infestations as analyzed in Alternative 2 if she chooses Alternative 3. The effects of using herbicide under Alternative 3 would be less than the effects described in Alternative 2 because the harvest area, and therefore the potential herbicide treatment area, would be less.

USEPA-25: We encourage tracking of weed infestations, control actions, and effectiveness of control actions in a Forest-level weed database.

The location, size, and composition of new and existing weed infestations are tracked in the NRIS TESP/Invasives database. Herbicide treatments and effectiveness are tracked in the FACTS database. These are both corporate databases used throughout the Forest Service.

USEPA-26: Measures that we often recommend for preventing spread of weeds from source areas to uninfested areas include:

- → **Ensure that equipment tracks and tires are cleaned prior to transportation to an uninfested site.**
- → **Focus control efforts at trail heads and transportation corridors to prevent tracking of seed into uninfested areas.**
- → **Attempt to control the spread from one watershed to another to reduce water as a transport vector.**

→ **If a localized infestation exists and control is not a viable option, consider rerouting trails or roads around the infestation to reduce available vectors for spread. Establish an education program for industrial and recreational users and encourage voluntary assistance in both prevention and control activities.**
→ **Reseed disturbed sites as soon as possible following disturbance.**

Cleaning equipment prior to entering a project area and revegetating disturbed sites are included in all timber sale contracts (Contract Provision C/CT6.26) and in mitigation measures (FEIS page 2-18, 2-21).

The other measures listed above are not related to the activities proposed in this project. However, they are practices routinely applied through the noxious weed program on the Bitterroot NF. Control efforts are concentrated at trailheads and along roads, containment strategies are used if a weed species is restricted to one watershed; and education on weed prevention is widely used.

USEPA-27: The greatest vector for spread of weeds is through motorized vehicles-cars, trucks, ATVs, motorcycles, and even snowmobiles….

We believe an effective noxious weed control program should consider restrictions on motorized uses, particularly off-road uses, where necessary… Restrictions on motorized uses may also be needed after burning and harvest activities until native vegetation is reestablished in the disturbed areas to reduce potential for weed infestation of the disturbed sites.

Off road travel has been restricted on the Bitterroot NF since 2001. The Forest is currently analyzing travel management and will designate trails and areas open for all-terrain vehicle use. In the Lower West Fork project, the ID Team proposes to decommission 10 or 27 miles of road in Alternatives 2 and 3, respectively, and store 19 miles of road (the same miles of road storage in each alternative).

USEPA-28: Prescribed fire has the potential to stimulate weed growth (e.g., Dalmation toadflax or leafy spurge), and can destroy insects planted for biological weed control: We suggest that these considerations be evaluated for burn units.

There are no known infestations of Dalmation toadflax or leafy spurge in the Lower West Fork project area. Studies on the effects of prescribed fire on leafy spurge biological controls (flea beetles) resulted in beetle population increases post-burn. Burns needed to be completed in time for leafy spurge plants to resprout prior to beetles emerging (Fellows and Newton 1999). One year after the 2000 fires burned in Sleeping Child and Skalkaho drainages flea beetles were found alive on leafy spurge plants (Bessler-Hackett , personal communication). No research was found on the effects of fire on spotted knapweed biological controls, but most likely effects should be minimal if prescribed fires occur when insects are dormant (before June and after September).

USEPA-29: Where no native, rapid cover seed source exists, we recommend using a grass mixture that does not include aggressive grasses such as smooth brome, thereby allowing native species to eventually prevail.

A copy of the Forest Seed Mixes is included in the project file (PF-NOX-001). The Bitterroot National Forest no longer uses aggressive exotic grasses like smooth brome, timothy or orchard grass. Some non-native grasses, like sheep fescue, are used since they are more effective at competing with noxious weeds.

USEPA-30: …we encourage prioritization of management techniques that focus on non-chemical treatments first, with reliance on chemicals being the last resort, since weed control chemicals can be toxic and have the potential to be transported to surface or ground water following application.

Our first priority is preventing weed establishment and/or spread. Mitigation measures and contract clauses are in effect to reduce the risk of spreading weeds (FEIS 2-21 thru 2-23). Chemicals will only be used in areas where preventive measures fail and weeds are found to be encroaching into openings or disturbed areas created by the proposed activities.

USEPA-31: It is important that the water contamination concerns of herbicide usage be fully evaluated and mitigated. All efforts should be made to avoid movement or transport of herbicides into surface waters that could adversely affect fisheries or other water uses….

We are pleased that potential effects of use of herbicides on aquatic life has been evaluated (pages 3.6-23, 3.7-22), and that the herbicides proposed for use have relatively low toxicity (page 3.6-6), although some herbicide shown in Table 3.5-8 (page 3.5-22) can exhibit toxicity,

The ID Team evaluates potential herbicide contamination of water in the FEIS (FEIS pg. 3.6-22 thru 3.6-26 and 3.7-23 thru 3.7-28). The ID Team expects that complying with the RHCA spray mitigations in Table 3.7-4 (FEIS pg. 3.7-26) and the mitigation measures (FEIS pg. 2-21) will keep herbicides out of surface waters and protect aquatic life (FEIS pg. 3.7-28). The Bitterroot National Forest conducted a limited water quality monitoring during 2004 and 2005 large area aerial spray operations. The Forest Service did not detect any herbicide chemicals in nearby streams at the 0.0001 part per million detection limit (PF, FISH-10, FISH-11). Drift cards set up along riparian corridors also failed to detect droplets of herbicide (PF, FISH-10). Although aerial spraying is not proposed in this project, the risk of water contamination is generally higher with aerial spraying than with ground-based spraying. Therefore, the ID Team expects that since similar mitigation measures were effective in protecting water quality during aerial spraying, they have a very good chance of effectively protecting water quality during ground-based spraying activities.

USEPA-32: It is stated that the maximum application rate of picloram would be 1.0 pound per acre (page 3.5-27). We generally recommend that picloram not be used at rates greater than 0.25 lbs/acre, and suggest that the Forest Service consider applications of persistent herbicides such as picloram only once per year to reduce potential for accumulation in soil.

Picloram will only be used in a few areas usually where access is difficult, due to its longer residual properties. Applications will not exceed the allowable rates directed by the chemical label specifications. In most cases, picloram application rates will remain much lower than the allowable label rate, For example, the control rates the Forest Service uses for spotted knapweed, sulfur cinquefoil, and oxeye daisy are ¼ (0.25 lb/ac) of the maximum allowable rate. However, higher rates of picloram are required to successfully treat other species such as dalmatian toadflax and leafy spurge (USDA Forest Service 2003a, p 2-20). Our standard procedure is to apply picloram once per year on a site to stay well within the allowable label limits of use.

In addition, the Forest Service intends to apply a newer herbicide, aminopyralid (brand name Milestone®) on most sites instead of picloram because aminopyralid has a shorter residual property, is effective on many weed species, and has less impact on non-target species when applied at the recommended rates

USEPA-33: We also recommend that road ditches leading to intermittent and perennial streams be flagged as no-spray zones and not sprayed with picloram based herbicides. Herbicides should be applied at the lowest rate effective in meeting weed control objectives and according to guidelines for protecting public health and the environment.

We are pleased that each of the action alternatives includes activities to improve watershed conditions (i.e., road storage and decommissioning, removing culverts that increase sediment production and/or serve as fish barriers, and restoring soil in areas impacted by prior terracing disturbances).

The ID Team added a mitigation measure to the FEIS that states, "Dry roadside ditches that lead into intermittent and perennial streams will not be sprayed with any herbicides containing picloram." (FEIS pg. 2-22, 2-23).

Herbicides will be applied according to the manufacturers' recommendations, which include protection of public health and environment. See pages 2-21 to 2-23 and 3.7-26 in the FEIS for mitigation measures related to herbicide application.

USEPA-34: Tordon 22K herbicide can be applied using wick or carpet roller equipment where drift presents a hazard to susceptible crops, surface waters, and other sensitive areas. One part Tordon 22K is mixed with 2 parts water to prepare a 33% solution. The wick method of application is more labor intensive but very effective at targeting particular noxious weeds adjacent to surface waters, wetlands, or protected plants.

This method has been used on the Bitterroot NF and will be used if needed to protect sensitive areas or rare plants.

USEPA-35: It is important that U.S. Forest Service employees be certified throughout the duration of the project. If commercial applicators will be contracted for RUP applications, we recommend checking to make sure their MT commercial RUP license is current… Also, please note that registration for Access (which has picloram as an active ingredient) is cancelled

All applicators (contract or Forest Service employees) are required to be licensed or supervised by someone licensed (FEIS pg. 2-22). Also, all Forest Service applicators receive annual herbicide handling and application training approved by the Montana State Dept. of Agriculture. Standard operating contractor evaluation procedures require that contract bidders submit documentation that they hold a current commercial license in Montana that includes restricted use pesticides (RUPs). The Lower West Fork project will follow these standard evaluation procedures. Thank you for the information about Access. The Forest Service has not used and does not stock that product on the Bitterroot NF.

USEPA-36: Some suggestions we have to reduce potential water quality and fisheries effects from herbicide spraying are to assure that applicators: 1) are certified and fully trained and equipped with the and appropriate personal protective equipment; 2) apply herbicides according to the label; and 3) herbicide applicators should take precautions during spraying…4) no herbicide spraying will occur in streams and wetlands or other aquatic areas (seeps, springs, etc,); 5) streams and wetlands in any area to be sprayed be identified and flagged on the ground to assure that herbicide applicators are aware of the location of wetlands, and thus, can avoid spraying in or near wetlands; 6) use treatment methods that target individual noxious weed plants in riparian and wetland areas (depending on the targeted weed species, manual control or hand pulling may be one of the best options for weed control within riparian/wetland areas or close to water).

Thank you for your suggestions and know the Forest Service follows them. See the above response concerning the training and certification of Forest Service herbicide applicators. Forest Service applicators are equipped with personal protective gear and equipment that exceeds label requirements. Applicators are required to use the appropriate herbicides near riparian zones and live water. Contract inspections and supervisor monitoring insure that applicators comply with these requirements. All applicators have reviewed and are provided with copies of any applicable NEPA mitigation measures involving herbicide application practices, including applications in riparian or wetland areas or close to water. Mitigation measures for herbicide use adjacent to riparian and other aquatic areas are included in the FEIS (FEIS pg. 2-21 thru 2-23, 3.7-26). Precautions herbicide applicators take during spraying are in the FEIS (FEIS pg. 2-22, 2-23). Hand-pulling is used on small, new weed infestations where it is economically feasible. However, hand pulling is not very effective at controlling rhizomatous weeds such as oxeye daisy and St. Johnswort.

USEPA-37: We also recommend that weed treatments be coordinated with the Forest botanist to assure protection to sensitive plants, and coordinated with fisheries biologists and wildlife biologists to assure that sensitive fisheries and wildlife habitat areas are protected. Please also note that there may be additional pesticide use limitations that set forth geographically specific requirements for the protection of endangered or threatened species and their designated critical habitat. This information can be found at http://www.epa.gov/espplbulletins.htm.

Thank you for the information regarding geographically specific pesticide limitations to protect threatened and endangered species and their designated critical habitat. Bitterroot NF staffs responsible for protection and management of threatened and endangered species review the literature for new developments in pesticide effects and coordinate with the Forest Invasive Plants and Rangeland Program Manager. The Forest Botanist, and south zone fisheries and wildlife biologists were part of the interdisciplinary team that developed the herbicide spray restrictions for this project. The Fisheries Biologist expects restrictions on herbicide spraying in RHCAs (FEIS pg. 2-22, 3.7-26) will satisfactorily protect threatened bull trout and their critical habitat, and sensitive westslope cutthroat trout and their habitat (FEIS pg. 3.7-28). The Forest Botanist will be contacted prior to off-road herbicide applications to avoid sensitive plant habitats, and herbicides will not be applied in sensitive plant locations (FEIS 2-21).

USEPA-38: You may also want to consider use of a more selective herbicide (clopyralid) for use in conifer associated communities to reduce impacts on non-target vegetation. We also note that spotted knapweed, which is a prevalent noxious weed species in western Montana, is non-rhizomatous and should be relatively easy to control with lower rates of the most selective low toxicity herbicides.

The Bitterroot NF routinely uses clopyralid on noxious weeds to protect conifers, rare plants, and other non-target species. As noted above in USEPA-32, the lowest rate possible will be used to control target weed species. The Forest Service agrees that spotted knapweed can be controlled with lower rates of herbicides than other weed species.

USEPA-39: …the website for EPA information regarding pesticides and herbicides is http://www.epa.gov/pesticides/... http://nptn.orst.eduftech.htm... has a wealth of information on toxicity, mobility, environmental fate on pesticides that may be helpful (phone number 800-858-7378)..

Thank you for the website link information.

USEPA-40: We support protection of old growth habitats and maintenance or restoration of native, late-seral overstory trees and forest composition and structure within ranges of historic natural variability.

Thank you for your support.

USEPA-41: …we do not oppose underburning to reduce fuel loads and ladder fuels in old growth, since it lessens the threat of stand removal by a wildfire and reduces competition with other vegetation to promote large diameter trees. Careful prescribed burning in old growth stands can reduce fuel loads and fire risk in such stands, and thus, may promote long-term protection and sustainability of old growth stands.

Thank you for your support

USEPA-42: The DEIS states that proposed timber harvest and burning will reduce snags and cavity habitat in 13% of the project area in Alternative 2 and (page 38-13), but that 2-5 to 10-15 snags would be retained depending upon the habitat type (page 1-11)

Snags will be left unless they present an OSHA hazard during timber harvest. Some snags may burn during prescribed burning but other snags may be created through the same activity.

USEPA-43: If it is determined that the finally selected project alternative could adversely affect any threatened or endangered species (e.g., gray wolf, lynx) the final EIS should include the associated U.S. Fish & Wildlife Service (USFWS) Biological Opinion or formal concurrence for the following reasons:

(a) NEPA requires public involvement and full disclosure of all issues upon which a decision is to be made;

(b) The CEQ Regulations for Implementing the Procedural Provisions of NEPA strongly encourage the integration of NEPA requirements with other environmental review and consultation requirements so that all such procedures run concurrently rather than consecutively (40 CFR 1500.2(c) and 1502.25); and

(c) The Endangered Species Act (ESA) consultation process can result in the identification of reasonable and prudent alternatives to preclude jeopardy, and mandated reasonable and prudent measures to reduce incidental take.

… EPA recommends that the final EIS and Record of Decision not be completed prior to the completion of ESA consultation. If the consultation process is treated as a separate process, the Agencies risk USFWS identification of additional

The FEIS will be released to the public prior to completing ESA consultation with the U.S. Fish and Wildlife Service. However, the Record of Decision will not be signed until all ESA consultation is completed. Upon release of the FEIS, the U.S. Fish and Wildlife Service has 135 days to write a Biological Opinion or 30 days to issue a concurrence letter. As soon as the Bitterroot NF receives a Biological Opinion or concurrence letter from the U.S. Fish and Wildlife Service, those documents will be placed in the project file. In 2008, Forest fisheries biologists presented the Lower West Fork project to the Western Montana Bull Trout Level I Team. The team consists of U.S. Fish and Wildlife Service fisheries biologists and fisheries biologists from the western Montana National Forests and Bureau of Land Management. The team provided a critical review that helped shape the project and avoid potential consultation pitfalls. Also, the Forest recently completed consultation on two other neighboring projects (the Trapper Bunkhouse FEIS and Selway-Bitterroot Wilderness Invasive Plants Management Project FEIS). The issues and lessons learned during those two consultations have been incorporated into the Lower West Fork consultation.